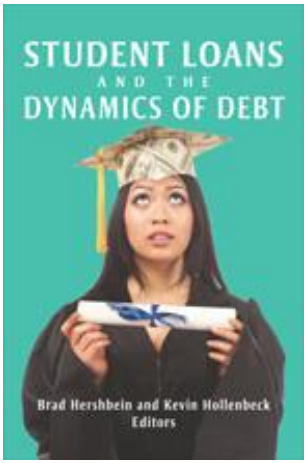
W.E. UPJOHN INSTITUTE FOR EMPLOYMENT RESEARCH

Upjohn Institute Press

Private Student Loans and Bankruptcy: Did Four-Year Undergraduates Benefit from the Increased Collectability of Student Loans?



Xiaoling Ang
Consumer Financial Protection Bureau

Dalié Jiménez
University of Connecticut School of Law

Chapter 7 (pp. 175-234) in:
Student Loans and the Dynamics of Debt
Brad Hershbein, Kevin M. Hollenbeck, eds.
Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2015.
DOI: 10.17848/9780880994873.ch7

Student Loans and the Dynamics of Debt

Brad Hershbein
Kevin M. Hollenbeck

2015

W.E. Upjohn Institute for Employment Research
Kalamazoo, Michigan

Library of Congress Cataloging-in-Publication Data

Hershbein, Brad.
Student loans and the dynamics of debt / Brad Hershbein. Kevin M. Hollenbeck.
pages cm
Includes index.
ISBN 978-0-88099-484-2 (pbk. : alk. paper) — ISBN 0-88099-484-3 (pbk. : alk. paper) — ISBN 978-0-88099-485-9 (hardcover : alk. paper) — ISBN 0-88099-485-1 (hardcover : alk. paper)
1. Student loans—United States. 2. Finance, Personal—United States. I. Title.
LB2340.2H47 2014
378.3'620973—dc23

2014043892

W.E. Upjohn Institute for Employment Research
300 S. Westnedge Avenue
Kalamazoo, Michigan 49007-4686

Cover design by Alcorn Publication Design.
Index prepared by Diane Worden.
Printed in the United States of America.
Printed on recycled paper.

7
Private Student Loans and Bankruptcy

Did Four-Year Undergraduates Benefit from the Increased Collectability of Student Loans?

Xiaoling Ang
Consumer Financial Protection Bureau

Dalié Jiménez
University of Connecticut School of Law

What effect will a law that virtually eliminates the possibility that a loan will be discharged in bankruptcy have on the pricing and availability of that loan? This chapter seeks to answer that question by investigating the effect of bankruptcy discharge on private student loans (PSLs). We use a unique data set and find some unexpected results.

On April 20, 2005, President Bush signed the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) into law.[1] The bill was the result of intense political wrangling dating as far back as 1999.[2] Proponents of the bill argued that the significant increases in bankruptcy filing rates were the result of strategic debtors taking advantage of lax bankruptcy rules; a problem that they thought would be solved by increasing the hurdles to a bankruptcy discharge.[3] Opponents argued that the vast majority of debtors filed bankruptcy for reasons largely beyond their control: loss of a job, divorce, medical issues, or a death in the family. Many argued that instead of further limiting bankruptcy protection, Congress should focus on regulating the availability of credit.

Proponents of bankruptcy reform predicted that its effect would be to reduce the cost of consumer credit by reducing the "bankruptcy tax" implicitly spread to all consumers in their cost of credit. Opponents of the bill hypothesized that consumer lenders were providing a rebate of

the bankruptcy tax to high credit-scoring borrowers, and thus expected no change in the cost of student loans as a result of BAPCPA.[4] In this chapter, we report on our tests of some of the predictions made by both groups as they relate to the market and pricing of private student loans.

The 2005 amendments added private student loans (PSLs), that is, loans originated by the private market and not insured by any federal or state institution, to the list of debts presumptively nondischargeable in bankruptcy. Through a series of legislative changes that began in 1976 and culminated in 1998, loans made, guaranteed, or insured by the federal or state governments, as well as loans made by nonprofit institutions, were already presumptively nondischargeable before 2005.[5]

This special treatment granted to PSLs ran counter to two of the fundamental policies behind the bankruptcy laws: the equality of treatment of creditors in bankruptcy and the fresh start for the debtor.[6] Neither of these policies has ever been absolute—tax debts and debts obtained by fraud, for example, have both received priority over other unsecured creditors and been nondischargeable as far back as the Bankruptcy Act of 1898.[7] Nonetheless, most of the 19 so-called "rifle-shot" exceptions to discharge exist for strong policy reasons. For example, when domestic support obligations were added to the list of exceptions, the rationale was that this would "provide new protections for parents" and "strengthen their ability to collect child support."[8] The rationale for adding federal and state loans to the list of presumptively nondischargeable debts was to protect the public fisc.

PSLs are very different from the other kinds of student loans that were nondischargeable before the 2005 bankruptcy reform. A brief synopsis of their features is instructive because it highlights how extraordinary the law change was. Unlike federal student loans, PSLs are risk-priced at origination. Only creditworthy individuals (or individuals with creditworthy borrowers) are eligible to obtain PSLs.[9] Since the majority of undergraduate students do not have a significant credit history, most PSLs require students to secure a cosigner who will be responsible for the loan if the student does not repay. In fact, 90 percent of all PSLs required a cosigner in 2011, even if the student had a good credit history or was attending graduate school.[10] The cosigner is liable for the loan as much as the student is, even if the student does not finish school or dies.

PSL borrowers take on the risk of interest rate changes over the typical 15–20 year repayment period. The typical PSL is a variable-rate

loan, indexed to LIBOR or similar.[11] Students are offered loans at an "index-plus" variable interest rate. That "plus" (the interest rate charged above the index) is the risk premium, presumed to be closely related to the risk-of-loss that the lender places on that borrower. In this chapter, we refer to that plus as the "margin." All things being equal, a borrower with a higher credit score should receive a loan with a smaller margin than a borrower with a lower credit score. In 2011, initial variable PSL interest rates varied between 2.98 percent and 19 percent for the riskiest borrowers.[12] Finally, funding for PSLs during the period of our study came primarily from the secondary market through asset backed securities.[13]

When BAPCPA became effective on October 17, 2005, every outstanding PSL—no matter when originated—became presumptively nondischargeable for both borrowers and coborrowers. Loans that were originated before BAPCPA presumably priced in the cost of bankruptcy dischargeability in their margins (risk premiums), but those loans became presumptively nondischargeable all the same.[14]

The nondischargeability of PSLs is problematic from at least two perspectives: the concern that billions in outstanding student loans may be stifling the economy and the general lack of protections offered to delinquent borrowers.

Standing at over $1 trillion, student loan debt is the second largest type of debt Americans carry, surpassed only by mortgage debt. In recent years, regulators, policymakers, and academics have worried publicly over the effect this amount of debt has on our economy. PSLs are a small but significant feature of the American postsecondary education finance system and may become more prominent to the extent that other forms of aid do not keep pace with increasing costs of attendance. As of 2011, 15 percent of student loan debt had been originated by for-profit companies (typically, but not exclusively, banks) in the form of PSLs.[15] The current $150 billion in PSL outstandings is especially concerning because of the lack of protections for borrowers who cannot repay.

Outside of bankruptcy, federal student loans have protections for borrowers in financial distress. These include the ability for borrowers to enter into income-based or income-contingent repayment plans, temporarily suspend payments for up to 2 years, and extend the term of the loan for up to 30 years.[16] Federal loans are also eligible for cancellation

in the case of total or permanent disability, the death of a student or parent taking out a PLUS Loan, where the school that the student attends closes while the student is enrolled, or in some cases, if the student becomes a teacher or works in public service.[17] None of these features are found in the typical PSL. Student borrowers with federal and private loans will have a difficult time discharging either federal loans or PSLs, but they will have a much tougher time living with delinquent private loans because of the lack of protections for those in default. In addition, some students may have a disproportionate amount of PSL debt relative to federal loans because students need not exhaust their federal loan opportunities before obtaining a PSL. The CFPB found that "more than 54 percent of PSL borrowers do not exhaust their Stafford Loan eligibility, or do not even apply for federal aid."[18]

We would ideally like to be able to compare federal and PSL default rates and bankruptcy filing rates. Unfortunately, it is impossible to compare the default rate of federal loans versus PSLs, owing to differences in the methodology of calculating those rates and the lack of availability of data. The Department of Education (DOE) does not report how many individuals with federal student loans have filed for bankruptcy. The DOE publishes "cumulative lifetime default rates" for loans that enter repayment during a fiscal year and have defaulted through the end of the fiscal year. As an example, for the cohort that graduated or left school in 2006 that had federal student loans, the DOE estimates that 9.2 percent will default over their lifetime.[19] In contrast, what we know about PSL default rates is limited to the origination-year level (also called "vintages") or alternatively to loans outstanding at the end of a year. The CFPB found that lenders' underwriting practices had a significant effect on PSL default rates. While some securitized trusts have "default rates expected to reach 50 percent," some depository institutions that never securitized their loans have default rates of less than 4 percent.[20] The nine lenders in our study had approximately $8.1 billion in cumulative defaults as of 2011, a figure made up of approximately 850,000 distinct loans.[21] Between 2005 and 2011, as few as 0.2 percent of outstanding PSLs and as high as 1.1 percent of all outstanding loans made by the lenders in our study were included in a bankruptcy filing.[22]

This chapter relies on a unique large data set that sheds some light on the typically opaque private student loan market. Per a congressio-

nal mandate, the CFPB collected data that have never been available before.[23] Our data set covers loan-level information for all PSL originations made by the nine largest PSL lenders between 2005 and 2011. The data are de-identified but include borrowers' and coborrowers' credit scores, amount borrowed, the student's year in school, and the name of the school the student is attending. We merge these data to DOE administrative data sources that provide school-level information about federal student loans as well as institutional characteristics.

Lenders use most of these variables in their underwriting. Credit scores in particular are highly correlated with loan grants and pricing. However, we do not observe all variables that lenders have available for underwriting purposes. For example, lenders may have asked about coborrowers' employment or income or have included information from a credit report (e.g., the fact that someone has a large number of credit cards) that we do not observe. The granular information from the credit report is "baked in" the credit score number, but income is not.

We find that excluding PSLs from discharge in bankruptcy decreased the average credit score of borrowers and increased the volume of loans but also *increased* the overall cost of loans. This latter finding runs counter to general economic theory as well as the arguments of both proponents and opponents of BAPCPA. Specifically, we find that the credit score composition of borrowers after the law changed skewed toward the lower end of the credit score spectrum, but the average borrower credit score only decreased slightly in practical terms. We also find that the overall cost of PSLs at four-year undergraduate institutions increased by an average of 35 basis points (0.35 percent) as a result of the law change. Finally, we observe that the volume of loans originated tripled after BAPCPA and find that 60 percent of that increase is attributable to the law change.

The first section of this chapter provides some background on PSLs and a brief literature review. The second section describes the competing theories predicting the effect of BAPCPA on credit and bankruptcies. The third section describes our unique data set, its limitations, and our empirical strategy. We report our results in the fourth section. Following that, we attempt to explain our surprising findings and consider welfare implications. We conclude by discussing next steps.

BACKGROUND AND LITERATURE

Since 1976, federal student loans have received some form of bankruptcy protection. The stated purpose when the first restriction on the dischargeability of federal loans passed in Congress was a concern that students were using bankruptcy opportunistically to wipe out their student debt on the eve of a "lucrative career."[24] There has never been empirical evidence of widespread strategic default with regard to student loans. Even as far back as 1977, the evidence pointed to the contrary—strategic defaults are a rarity.[25] Nonetheless, by 1998, federal loans became nondischargeable "unless excepting [them] from discharge . . . would impose an undue hardship on the debtor and the debtor's dependents."[26] In 2005, PSLs were added to the list.[27] In this section, we explain the legal implications of this treatment and put it in context of the empirical studies that have examined its effect to date.

Congress never elaborated on the meaning of "undue hardship." The sole mention of the phrase in the congressional record comes from opponents of the amendments who called it "vague" and argued that the provision itself "may create an undue hardship for good faith bankrupts" because "the standard is a very hard one. It will be very difficult to meet. Worse, it will be variously interpreted by different judges around the country and even in the same judicial district."[28] As we discuss below, there is some evidence that this is what happened.

The nondischargeability provision has been amended five times with the same "undue hardship" language, with no clarification from Congress.[29] In the meantime, courts have settled on two interpretations of the phrase. Almost all courts use the fairly rigid Brunner test to evaluate whether a debtor can overcome the presumptive nondischargeability of student loans.[30] Rebutting the presumption can be a difficult task. To do so, the debtor must file an "adversary proceeding" (effectively a lawsuit) with the bankruptcy court against her student loan creditors. She must convince the court by a preponderance of the evidence that repaying her loans would present an undue hardship.[31] The bankruptcy court must determine whether the debtor has met the threshold for dischargeability, even if the creditor does not respond to the suit.[32] If the debtor loses the lawsuit, or does not file one in the first place, her student loans are unaffected by the bankruptcy.[33]

A handful of empirical studies have examined debtors seeking to discharge student loans in bankruptcy and how they fared in the courts. Three key findings pertain to this study: 1) an almost infinitesimal number of student loan borrowers seek to discharge their student loans in bankruptcy; 2) discharge seekers are outliers—they have high educational debt relative to the population and find themselves in especially miserable situations; and 3) about half of discharge seekers are successful, but the reasons for their success are not entirely explainable by objective factors.

Only a handful of individuals attempt to discharge their student loans in bankruptcy. In the only nationwide study on the subject, Jason Iuliano estimates that of the individuals who filed bankruptcy in 2007, only 0.1 percent had student loans and sought to discharge those loans.[34] That percent amounted to 213 individuals out of the 169,774 who filed a bankruptcy case in 2007 and had a student loan.[35]

Based on Iuliano's study as well as two studies from Rafael Pardo and Michelle Lacey, we can establish a picture of the "typical" discharge seeker.[36] All three studies find that the average discharge seeker is over 41 years old, well past typical college age.[37] Between 62 and 80 percent of discharge seekers were unmarried, but most had one or more dependents, which is suggestive of a number of single-parent households.[38] Fewer discharge seekers tended to be employed at the time they file bankruptcy relative to the rest of the bankrupt population.[39] Unsurprisingly, discharge seekers are in more financial distress. "They make less money, own fewer assets, and have more liabilities, including educational debt" than nondischarge seekers.[40] The average educational debt load varies between $47,137 in the oldest study to $80,476 in the study with the most recent data.[41] Discharge seekers are also in dire straits: more than half of them suffered from a medical condition themselves or had one or more dependents with a condition.[42] The majority of the discharge seekers seem to have tried various avenues to mitigate or resolve their student debt issues before filing bankruptcy.[43]

Discharge seekers are more often than not successful in obtaining at least a partial discharge: 57 percent of the adversary proceedings in Pardo and Lacey's study of bankruptcy cases filed between 2002 and 2006 in the Western District of Washington resulted in at least a partial discharge.[44] In Iuliano's study, 39 percent (or 81 individuals out of the almost 1 million nationwide bankruptcies in 2007) received either a

full or a partial discharge of their student loans.[45] This may seem like favorable odds, but it is likely a result of a selection bias. The more downtrodden and unfortunate, the more likely one might be to seek a discharge. These odds are nonetheless hard to predict: Pardo and Lacey argue that the undue hardship standard is not applied consistently.[46] Their 2005 study finds few statistically significant differences between debtors who were granted a discharge of their student loans versus those who were denied.[47] Troubling from an equal justice perspective, Pardo and Lacey also find that "factors unrelated to the command of the law (e.g., the identity of the judge assigned to the debtor's adversary proceeding), rather than factors deemed relevant by the legal doctrine (e.g., the debtor's income and expenses), account for the substantive outcomes" in the case.[48]

Iuliano and Pardo and Lacey's studies do not distinguish between federal and private loans, but they nonetheless give us a sense of who might seek and who might get their student loans discharged. Only one study has examined the effect of the bankruptcy reform on the availability of PSLs.[49] Mark Krantowitz from the Web site FinAid.org issued a report shortly after the law came into effect finding a small expansion in loan availability to borrowers with lower FICO scores. [50] Using data from student loan securitizations,[51] he found a 1.2 percent increase in loans to borrowers with FICO scores less than 650 (typically considered subprime borrowers) after BAPCPA.[52] However, when looking only at loans originated without a coborrower, Krantowitz found that credit contracted after BAPCPA by 1.7 percent for subprime borrowers. He also found a modest increase (5.2 percent) in PSL availability to borrowers with a FICO score between 651 and 710 (generally considered prime).[53] Krantowitz also found that in some of his sample the average FICO score post-BAPCPA dropped from 719 to 715, further indicating a slight credit expansion to borrowers with lower creditworthiness.[54]

Until now, Krantowitz's report has been the only analysis attempting to answer the question of the effect of BAPCPA on the pricing and availability of private student loans. His findings that credit moderately expanded are consistent with the hypotheses we discuss in the next part of this chapter.

ANALYTICAL FRAMEWORK AND HYPOTHESES

Under the dominant legal and economic theory behind the latest round of bankruptcy reform, the "easy" availability of bankruptcy was thought to have one of two effects: increasing the cost of credit for everyone to account for strategic borrowers or rationing credit, leading to a suboptimal amount of available credit. Opponents of bankruptcy reform, on the other hand, argued that there was no empirical evidence for this view: household credit increased dramatically, even as bankruptcy filings were increasing in the late 1990s. In their view, lenders in particular stopped rationing credit as early as the 1980s, just after the Supreme Court effectively lifted usury cap restrictions and after credit scoring had improved enough that lenders were better able to identify high-risk borrowers.[55] Each of these predicted effects yields some intuitions about what might happen to the cost of credit (specifically PSLs) post-BAPCPA. In this part, we develop three models to more formally theorize the expected result from the increased protection of PSLs in bankruptcy. In a later section, we compare the models' predictions to our results and discuss the similarities and (surprising) differences.

The majority of the 2005 bankruptcy reforms were directly responsive to a view of the world that assumed consumers were not only perfectly rational but also engaging in strategic behavior. We refer to this as the "bankruptcy tax" view. According to this view, strategic consumers impose a cost on the system by forcing lenders to either pass on the cost of opportunism to borrowers as a whole or ration credit. Portions of BAPCPA, including the PSL nondischargeable provision, were designed to ameliorate these problems. Some BAPCPA proponents posited that current strategic behavior was causing a "bankruptcy tax" of "$400-a-year on every household in the country."[56] Alternatively or in conjunction with a bankruptcy tax, lenders may ration credit in a world where bankruptcy is easy "in order to maintain underwriting standards."[57] One of the aims of bankruptcy reform was to reduce the number of opportunistic borrowers. In support of BAPCPA, Judge Posner theorized that "by increasing the rights of creditors in bankruptcy . . . [bankruptcy reform] should reduce interest rates and thus make borrowers better off."[58]

We can model this straightforwardly. Let x be a measure of the credit quality of a borrower and $f(x)$ denote the probability with which type x borrowers repay their loans, regardless of the loan amount. Let r be one plus the rate of return of the loan for the creditor conditional on the borrower repaying their loan,[59] and let $c(x)$ be the average recovery rate of loans that are not repaid in full.[60] For these purposes, assume that repayment rates and the average proportion repaid are increasing in x, so $f'(x) > 0$ and $c'(x) > 0$. Let $z(r)$ represent the original balance of a loan a borrower is willing to accept, which depends on the interest rate. Assume also that consumers are risk averse, so that $z'(r)$ and $z''(r) < 0$.

Further assume that the creditor is risk neutral and rational. Then for each borrower of type x, the creditor maximizes expected repayment or recovery net of the loan amount, as shown in Equation (7.1).

$$\max_r f(x)z(r)r + \big(1 - f(x)\big)z(r)c(x) - z(r) \tag{7.1}$$

A rational, risk-neutral creditor will only originate a loan for which expected repayment net of loan amount is nonnegative such that

$$f(x) \geq \frac{1 - c(x)}{r - c(x)} \tag{7.2}$$

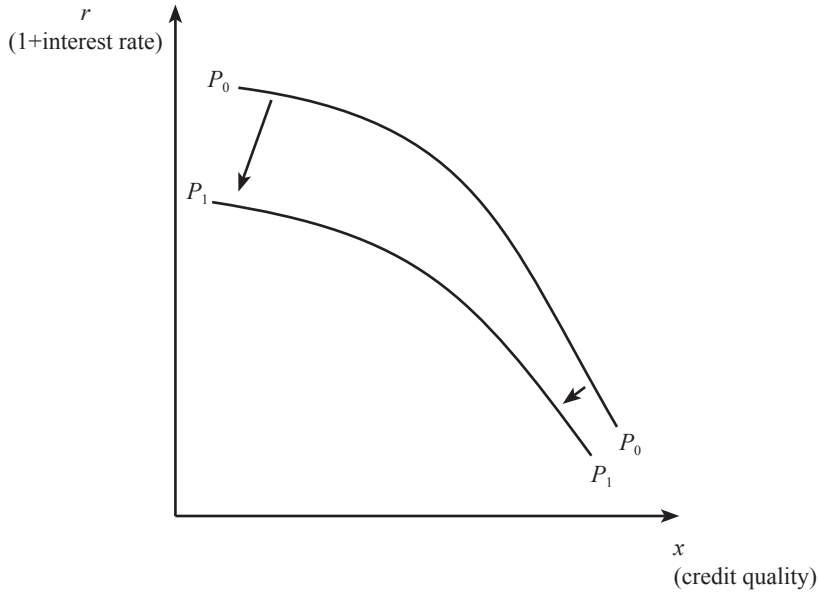
As the average recovery rate of the loans not repaid in full, $c(x)$ increases, the right-hand side of Equation (7.2) decreases, so if repayment rates are increased by BAPCPA, creditors would be willing to make loans to borrowers with lower values of x, so access to credit should expand.

Taking the first order conditions of Equation (7.1) and then differentiating implicitly yields Equation (7.3),

$$\frac{dr}{dc(x)} = \frac{-(1 - f(x))z'(r)}{[f(x)(r - c(x) - (1 - c)]z''(x)} < 0 \tag{7.3}$$

This implies that for any type x borrower, rates of returns conditional on borrowers repaying the loan in full should decrease if bankruptcy protection increases the recovery rate of loans that default, which would correspond to a decrease in interest rates for borrowers of all levels of credit quality, as shown in Figure 7.1, which illustrates the equilibrium price schedule for a PSL of a given size by credit quality. Prior

Figure 7.1 Effect of BAPCPA on Cost of a PSL of Fixed Size by Credit Quality



to BAPCPA, P_0 traces out the relationship between the cost of credit, captured by *r*, and credit quality, *x.* After BAPCPA, the increase in *c(x)*, the return given less than full payment at a given interest rate, resulting from higher rates of recovery conditional on bankruptcy, should be offset by a decrease in interest rates for borrowers, so the price schedule shifts from P_0 to P_1. Note that the size of the decrease may vary by credit quality.

Consider the case where the borrower is von Neumann-Morgenstern (VNM) rational, as assumed by proponents of bankruptcy reform.[61] In that case, his utility function can be expressed as

$$U(z,r;x) = g(x)u(z,r) + (1 - g[x])v(z,r),$$

where $g(x)$ is the borrower's ex ante belief about the probability that he will repay the loan, $u(z,r)$ is the expected utility from successfully being able to pay back his loan when he borrows z at interest rate $r - 1$, and $v(z,r)$ is his expected utility of not being able to pay back a loan that he

borrows at these terms. The larger the loan, the better off he is when he is able to pay it back, so $u_1 > 0$, and the worse off he is when he is unable to pay it back, so $v_1 < 0$. From the first order conditions

$$\frac{g(x)}{1-g(x)} = \frac{-v_1(z,r)}{u_1(z,r)},$$

which implicitly defines *z(r)*. Note that consumer overoptimism or positive cognitive bias can be captured by *g(x) > f(x)*. In other words, the borrower's belief about his ability to repay the loan is greater than his actual probability of repaying the loan.

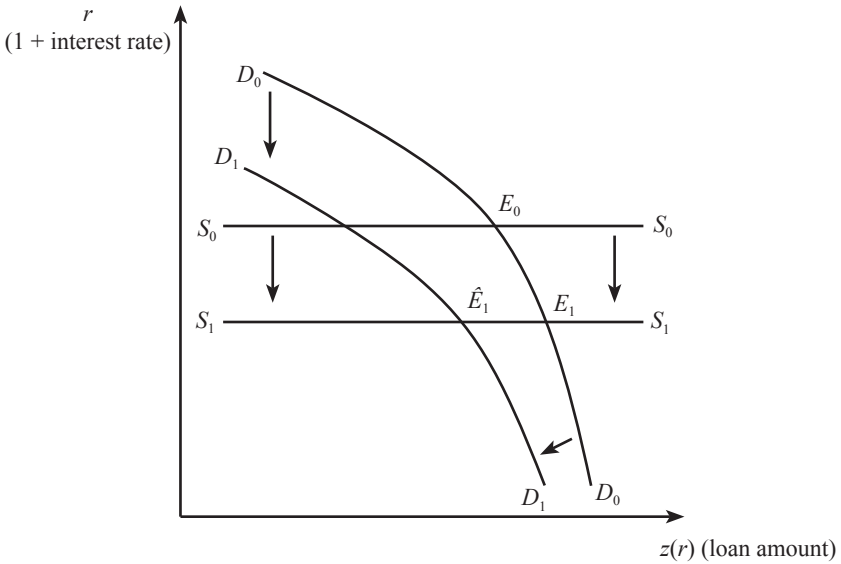
The new treatment of PSLs in bankruptcy—making them presumptively nondischargeable and effectively very unlikely to be discharged—makes the consequences of default more severe; a severity that increases with the size of the loan. We model this as the expected utility of not being able to repay a loan, *v(z,r)*, becoming $\hat{v}(z,r)$, and $\hat{v}_1$. Figure 7.2 illustrates the effect of BAPCPA on the supply of and demand for PSL for a borrower of a fixed credit quality, *x*. Assuming that ability-to-repay conditional on credit quality is not affected by BAPCPA—that is, there is no additional strategic default after BAPCPA—then *g(x)* is unchanged and

$$\frac{g(x)}{1-g(x)} = \frac{-v_1(z,r)}{u_1(z,r)} = \frac{-\hat{v}_1(\hat{z},r)}{u_1(\hat{z},r)},$$

so $\hat{z} < z$.[62] This implies that the VNM borrower's demand curve shifts down, as illustrated in Figure 7.2. Supply responds as described in Equation (7.3) and shifts from S_0 to S_1.[63] Equilibrium moves from E_0 to $\hat{E}_1$.

Note that the magnitude of this shift is determined by the relationship between the change in the expected utility of not being able to repay a loan and the average recovery rate of loans that are not repaid in full, *c(x)*, so, a priori, it is not possible to determine whether loan sizes will increase, decrease, or remain the same as a result of BAPCPA. Similar to Judge Posner's prediction for the law change, this simple model would thus predict that the price of the loans—in our parlance, the loan margin—will decrease after the law change and the effects on credit quality and volume are an empirical question.

Figure 7.2 Effects of BAPCPA on Supply and Demand of PSL for Consumers of a Fixed Credit Quality



As an alternative model, we also consider credit provision in the private student loan market in a Stiglitz-Weiss model in Appendix 7C.[64] For this model to hold, we assume that there is credit rationing in the private student loan market, as some BAPCPA proponents argued.[65] The Stiglitz-Weiss model predicts that the cost of credit will remain the same (because of rationing); the supply of credit will increase (increased volume of loans originated, as opposed to the ambiguous effect on quantity in the simple model); and that lenders will on average lend to riskier borrowers (in our data, lower credit scores).[66]

Opponents of BAPCPA have argued that the assumptions of strategic rationality on the part of consumers are too simplistic. Incorporating behavioral research findings and empirical research of actual debtors in bankruptcy, Susan Block-Lieb and Edward Janger propose a behavioral model of consumer bankruptcy that relaxes the assumption of consumer rationality but retains the assumption of lender rationality.[67] This is captured by the model presented above, since $f(x)$ and $g(x)$ can differ. Positive consumer biases, including optimism, present bias, and probability neglect, correspond to cases where $g(x) > f(x)$.

If we assume, for example, that borrowers are present biased, then they focus on the interest rate, and do not fully consider their probability of bankruptcy or the consequences of BAPCPA upon bankruptcy.[68] These behaviors could be captured by setting $g(x) = 1$ (assuming that a borrower believes he will definitely repay the loan) or by setting $\hat{v}(z,r) = v(z,r)$ (borrower ignores the consequences of bankruptcy), respectively. This would mean that borrowers' demand curves do not shift in response to BAPCPA. Instead, these loans will appear "cheaper" to borrowers because they are not fully accounting for the costs or are overly optimistic about their likelihood of repayment, and therefore loan originations and loan amounts should increase at any given credit quality, as shown in Figure 7.2. BAPCPA causes the supply curve to shift downward for individuals of credit quality x, which means that the price of credit, r, decreases. In response to this shift, the new equilibrium moves along the demand curve from E_0 to E_1, so the loan size demanded increases, in contrast to the loan size decrease we see in $\hat{E}_1$, the case where borrowers internalize the cost of nondischargeability.

Block-Lieb and Janger go further than this model. They theorize that "consumer lenders already provide a rebate of the bankruptcy tax" to subprime and less credit-worthy consumers.[69] This model is really a special case of the competitive model with present-biased consumer above. If, as Block-Lieb and Janger predict, the charge-off rate does not change post BAPCPA, then $c(x)$ does not change, and so the supply curve does not shift. Also, if consumers understand that $c(x)$ does not change, or if they do not factor in nondischargeability in bankruptcy into $v(z,r)$, the demand curve does not shift. Therefore, prices and borrowing decisions will remain the same.

To summarize, depending on what assumptions we make and what model we use, we would expect a variety of different outcomes for the effect of the change to the bankruptcy laws making private student loans presumptively nondischargeable, as shown in Table 7.1.

Incorporating all of these leads to the following hypotheses, which we test with our analysis:

- H0 — Price, average credit quality or loan amount, and total loan volumes will remain the same.
- H1 — Loan pricing (that is, lender margins) should remain the same or decrease for originations after the law change.

- H2 — Lenders should be willing to lend to borrowers with lower credit quality than they were willing to lend before the law change.
- H3 — Overall loan volumes should increase.
- H4 — Average loan amount should also increase independent of tuition and fees.

Table 7.1 Expectation of Outcomes by Theory

Outcome	Simple Competitive (CP) Model	Stiglitz-Weiss (credit rationing)	CP + Present-Biased Consumer	Block-Lieb & Janger (CP + $\Delta c(x)=0$)[70]
Price	Decrease	No change	Decrease	No change
Credit quality	Decrease	Decrease	Decrease	No change
Loan amount	Ambiguous	Increase	Increase	No change
Loan volume	Ambiguous	Increase	Increase	No change

DATA AND METHODOLOGY

Data

Our data set was created by CFPB economists in preparation for the congressionally mandated report on PSLs issued in 2012.[71] The data set includes PSL originations from the nine largest PSL lenders in the period between the first quarter of 2005 and the last quarter of 2011.[72] The data do not allow us to identify the lender for a given loan, but it does contain origination information at the individual loan level. The variables available in the data set include the loan amount, credit score of the borrower, credit score of any coborrowers, interest rate for fixed-rate loans, margin and the index used for variable rate loans, and the state of residence of the borrower.[73] This data set was merged to two public administrative data sets maintained by the Department of Education: the Integrated Postsecondary Education System (IPEDS) and the Postsecondary Education Participants System (PEPS).[74] IPEDS "gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid

programs."[75] It includes data on "enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid programs."[76] The PEPS data include school-level data on topics such as school characteristics, cohort default rates, and eligibility status.[77] We used these additional variables in the school-level analysis.

In order to compare PSLs to federal loans for the difference-in-differences (DD) analysis, we also made use of data from the DOE's Title IV Program Volume Reports for Direct Loans and Federal Family Education Loan Program (FFELP) loans at the school level in the 2004–2005 and 2005–2006 academic years.[78]

While the PSL data set includes originations on a variety of school types, for purposes of this study, we restricted the data set to originations for undergraduates at four-year institutions from the first quarter of 2005 and 2006. We limited ourselves to this smaller (though still considerable) sample because we thought the heterogeneity of school and program type (certificate, medical school, law school) might obscure the effect. We also limit ourselves to this time period to avoid conflating the effects of other major policy changes, such as the 2006 implementation of the Higher Education Reconciliation Act of 2005, which modified eligibility and application requirements for Title IV funds, with the effects of BAPCPA.[79]

Our outcome variables include the credit worthiness of student loan applicants (measured by the highest FICO score between the borrower and coborrower), the margins (interest above the index), the lender charged on the loan, the size of the loan, and the total number of loans originated. Table 7.2 presents summary statistics for private student loans originated in the first quarter of 2005 (before the law changed) and the first quarter of 2006 (after the law changed). Of note is the overall small reduction in mean and median FICO scores in 2006; this is true both for borrower FICO scores and for maximum FICO score (if the borrower applied with a coborrower, the maximum of the two scores). The average original balance and the number of loans originated increased; the latter more than tripled in the postperiod.

In Figure 7.3, we plot the distribution of maximum FICO scores before and after BAPCPA. We observe that the distribution shifts slightly to the left, so that FICO scores decrease after BAPCPA.

Table 7.2 Summary Statistics for Loans Originated in the First Quarter of 2005 and First Quarter of 2006

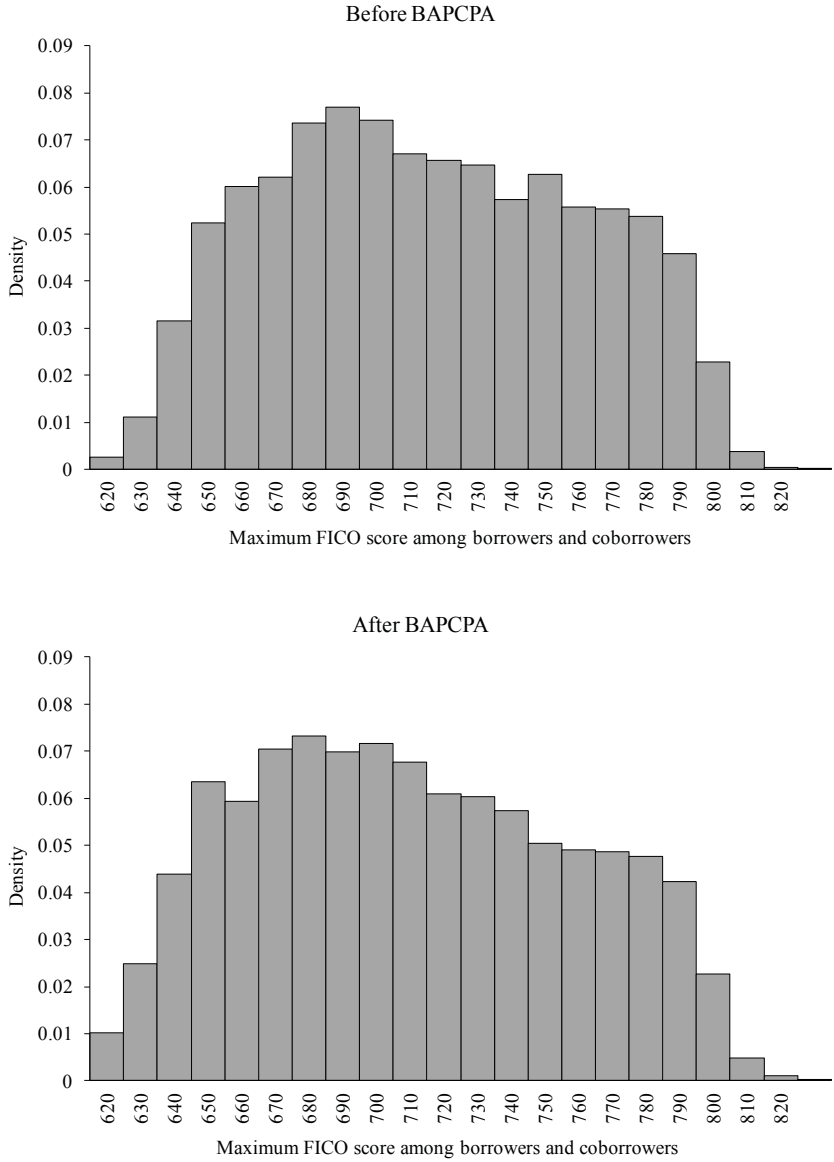
	Before BAPCPA (Q1 2005)		After BAPCPA (Q1 2006)	
	Mean	Median	Mean	Median
Has a coborrower	0.80	1	0.82	1
	(0.40)			
Maximum FICO score	720.34	718	714.96	700
	(47.50)		(47.45)	
Borrower's FICO score	651.02	662	648.65	660
	(65.44)		(67.48)	
Year in school	2.62	3	2.54	3
	(1.15)		(1.15)	
Margin (%)	4.18	4.75	4.63	4.85
	(1.59)		(1.06)	
Original balance ($)	8,614	6,271	10,015	7,650
	(6,956)		(785.4)	
Deferral term (months)	28.67	28	28.67	29
	(15.1)		(14.8)	
Tuition and fees ($)	11,485	7,229	11,091	7,795
	(8,011)		(8,200)	
Loans originated	4,960		15,318	

NOTE: Maximum FICO score is the maximum of the borrower and all coborrower scores. Standard deviations in parentheses. Restricted to loans originated in the first quarter of 2005 and 2006 to undergraduates at four-year institutions for which a borrower or coborrower's FICO score was reported.

Figure 7.4 displays the changes in margins between the first quarter before the law change and the same quarter one year later. Before the law changed, some lenders were originating PSLs that had a zero or below zero margin; in other words, they were not charging a premium above the index for some loans. After the law changed, surprisingly, premium-free or less-than-index loans were no longer being originated, and the distribution shifts toward higher margins.

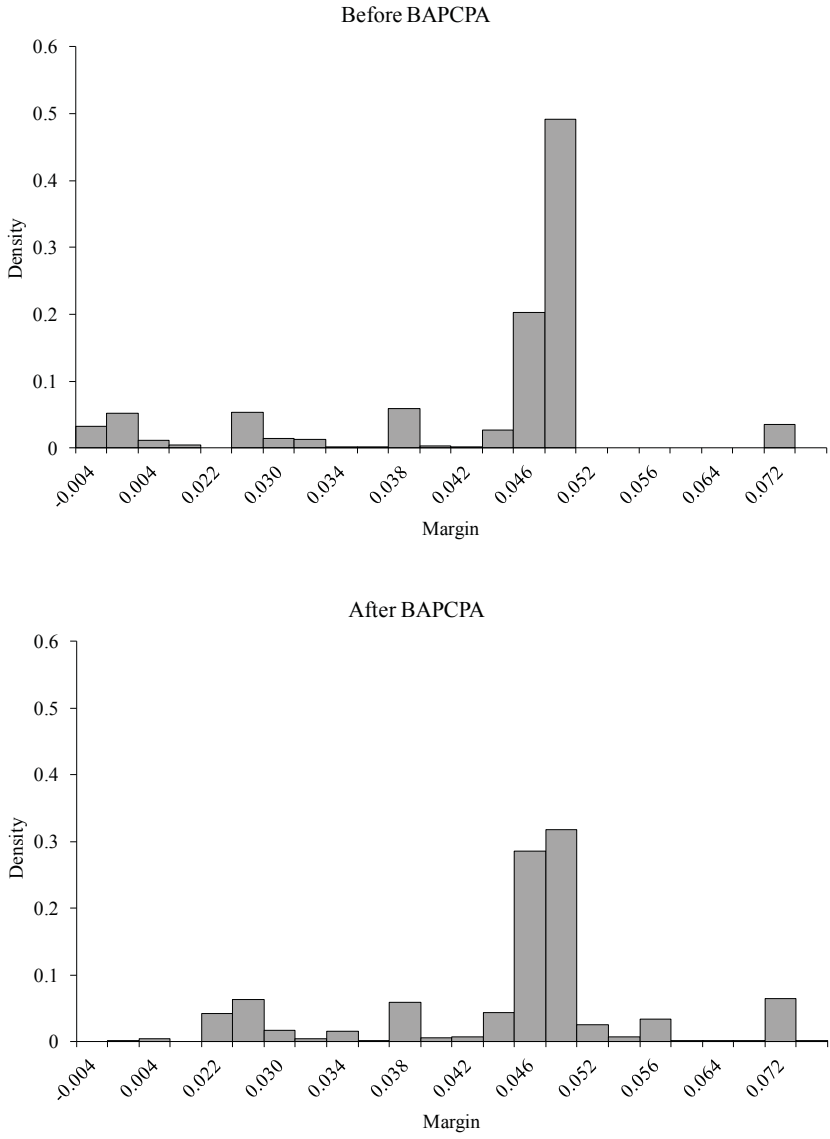
Figure 7.5 presents the distribution of the original balances of the loans originated in the first quarter before the law changed (Q1 2005) and the same quarter after the law changed (Q1 2006). Original balances are positively skewed in both time periods, but slightly higher after BAPCPA.

Figure 7.3 Distribution of Maximum FICO Scores Shifts toward Less Creditworthy Borrowers in the Post BAPCPA Period



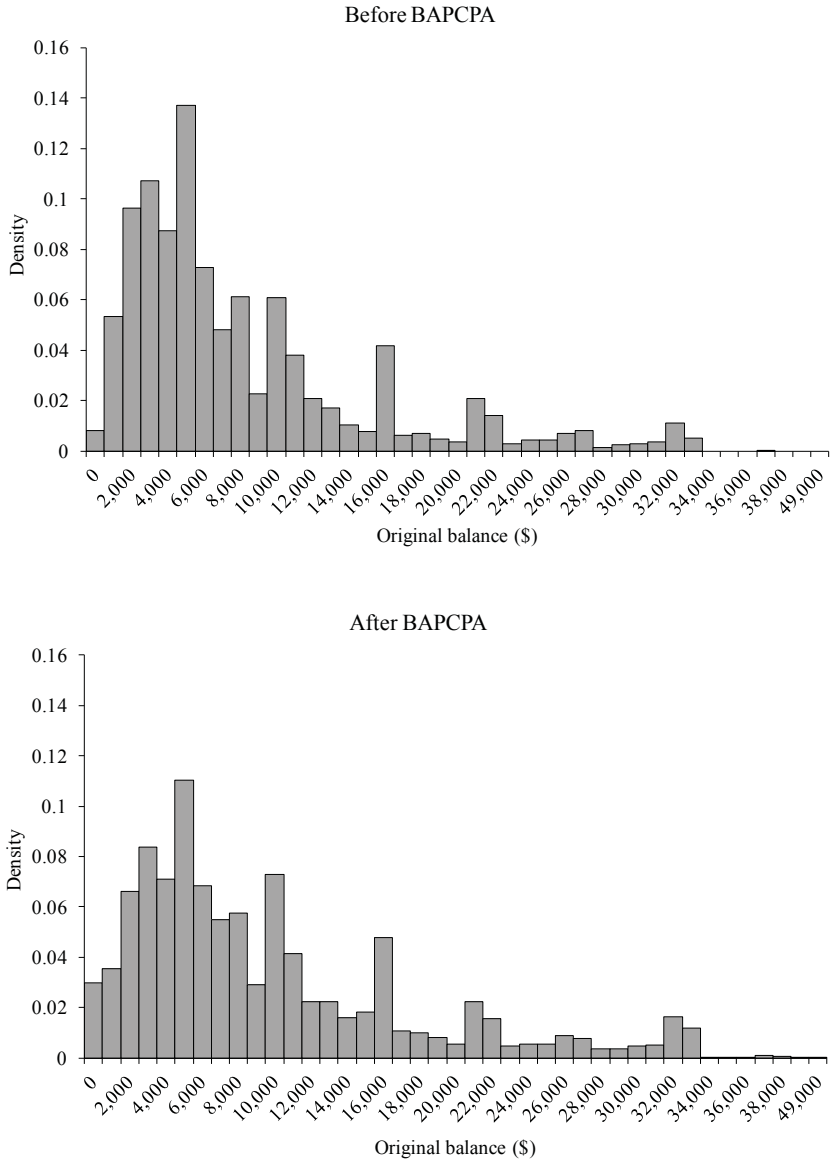
SOURCE: Authors' analysis of CFPB private student loan data.

Figure 7.4 Distribution of Margins Increased in the Post BAPCPA Period



SOURCE: Authors' analysis of CFPB private student loan data.

Figure 7.5 Distribution of Original Balances Increased in the Post BAPCPA Period



SOURCE: Authors' analysis of CFPB private student loan data.

Limitations

The available data impose some limitations on our analysis. The first limitation is related to the timing of bankruptcy reform, the second with the available data.

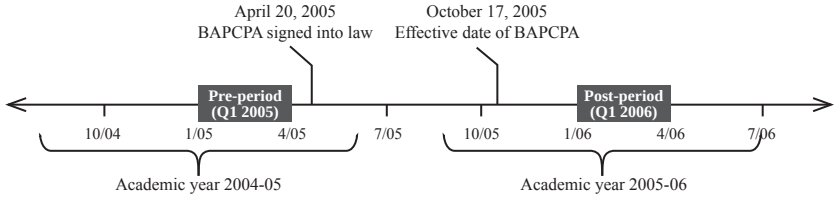
First, bankruptcy reforms, including changes to the dischargeability of PSLs, were debated in Congress as early as the mid-1990s, and by 1999 and 2000, the House and Senate had passed bills that included language adding PSLs to the list of presumptively nondischargeable loans in bankruptcy. These bills were vetoed by President Clinton in 2000.[80] The upsurge of Republican congressional members in the 2004 election and the public support of bankruptcy reform by sitting President Bush meant that the bill, as one newspaper phrased it in an opinion piece a month before the bill's passage, "gained the momentum of a runaway freight train."[81] The bill was introduced in the Senate on February 1, 2005, passed by both houses on April 14, 2005, was signed into law by President Bush on April 20, 2005, and became effective on October 17, 2005.[82]

Despite the lack of a "surprise" factor for the law change, lenders are unlikely to have made preemptive changes to their underwriting algorithms, primarily because by doing so they could lose the benefit afforded by the law's protection for at least some of the loans they would originate in anticipation. This is because BAPCPA did not apply retroactively: PSLs were not affected unless and until a bankruptcy case was filed after the law became effective. This means that PSLs only became presumptively nondischargeable for bankruptcies that were filed on or after October 17, 2005, and they became so regardless of when the loans were originated.[83] Prior to that date, the loans were dischargeable like most other forms of unsecured debt, such as credit card debts.

Our earliest data are from Q1 2005, before the law was passed or took effect. The law took effect at the very end of Q3 2005, so we use Q1 2006 as the effective postperiod. Figure 7.6 shows the timeline of the law changes and the available data.

We note one additional limitation to using first-quarter originations. Because the academic year traditionally runs from August to May, many student loans are originated over the summer or the fall. Beyond the fact that there are fewer originations in Q1 than Q3, loans originated in Q1 differ from loans originated in other quarters. Table 7.3

Figure 7.6 Major Events in Bankruptcy Reform and Our Data Set Observations



presents a comparison of first quarter 2006 originations to third-quarter originations in 2005 and 2006. Columns (2)–(5) present the results for ordinary least squares (OLS) regressions of the outcome variables with controls for quarter of origination and school fixed effects. Compared to first-quarter loans, third-quarter loans tend to have significantly larger original balances, are more likely to be originated through the school channel, are more likely to be made with coborrowers, and have slightly higher maximum FICO scores. To mitigate these seasonal differences, we restrict our analysis to comparing Q1 2005 data (the first quarter available) to Q1 2006 data.

Empirical Strategy

We analyze changes in loan characteristics—that is, changes in loan amount, debtor credit quality, and margin (risk premium cost)—at the loan level. We implement three methods in this analysis: 1) OLS regression, 2) Blinder-Oaxaca decomposition, and 3) propensity-score matching. We then collapse the data and analyze the volume of loans originated at the school level using the same three methods and also perform a DD analysis using volumes of federal loans as a comparison for PSL volumes.

Loan-level analysis

We can think of the price and terms of credit in terms of the expected returns for the creditor conditional on repayment, the amount of the loan extended, and the credit quality of the borrower. In our data set, these characteristics most closely correspond to margin (the risk premium),[84]

Table 7.3 OLS Regressions Comparing First-Quarter 2006 Originations with Third-Quarter 2006 Originations

	(1)	(2)	(3)	(4)	(5)
	Total originations	Original balance	School channel	Has a cosigner	FICO score
2006 Q1	16,017				
2005 Q3	37,795	1,927***	0.0420***	0.0250***	6.563***
		(78.89)	(0.00388)	(0.00356)	(0.473)
2006 Q3	26,127	2,689***	0.00796**	0.0499***	1.798***
		(74.17)	(0.00365)	(0.00334)	(0.445)
Constant		9,936***	0.248***	0.821***	716.5***
		(61.80)	(0.00304)	(0.00279)	(0.371)
Observations		79,913	79,939	79,939	79,939
R^2		0.148	0.293	0.079	0.098

NOTE:*p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Restricted to four-year undergraduates in the first quarter of 2006 and the third quarters of 2005 and 2006. Columns (2) through (5) represent separate OLS regressions and include school-level fixed effects.

original balance, and the maximum FICO scores among borrowers and coborrowers on a loan.[85] To evaluate how these characteristics changed as a result of BAPCPA, we implement three techniques.

As a first approach, we run OLS regressions of these characteristics, *y*, on *post*, a dummy variable for receiving a loan after the implementation of BAPCPA, and a vector of control variables, *X*, that would be included in an underwriting model, such as type of school attended, tuition and fees, credit score, year in school, and a constant, as shown in Equation (7.5).[86] The sample is restricted to individuals with valid FICO scores, as this is the dominant measure of creditworthiness used in the data set.

$$(7.5) \quad y_i = \beta_{post} post_i + \beta_x X_i + \varepsilon_i$$

Note that H2 discussed in the analytical framework implies that the coefficient on $\beta_{post} < 0$ when the outcome under consideration is the maximum credit score among all borrowers and H1 implies that at each maximum credit score, the interest rate should decrease, so $\beta_{post} < 0$.

$$(7.6) \quad y_i = \beta_{post} post_i + \sum_{j=1}^{N} \beta_j x_{ji} + \sum_{j=1}^{N} \beta_{j \times post} x_{ji} \times post_i + \varepsilon_i$$

We also perform this analysis with interactions between school and borrower characteristics, which are observable to the creditor, and an indicator for the postperiod. Let X_i be a vector of school or borrower characteristics, $X_i = [x_{1i} \quad x_{2i} \quad \cdots \quad x_{Ni}]'$. Then the interaction terms can be written as in Equation (7.6). For a borrower with characteristics X_i, the estimated effect of BAPCPA on the outcome variables is given by

$$\beta_{post} post_i + \sum_{j=1}^{N} \beta_{j \times post} x_{ij} \times post_i$$

Effectively, $\beta_{j \times post}$ can be interpreted as the contribution of having one more unit of x_j to the magnitude of the effect of the policy. For example, if two borrowers have identical characteristics except that one has a coborrower and the other does not, we would expect the effect of BAPCPA on their outcomes to differ by $\beta_{coborrower \times post}$ on average.

Since the lender data set only contains data for originated loans, one concern is that the composition of borrowers in the data set may change in response to changes in the loan offers by creditors. In order to separately identify effects due to changes in terms for borrowers who would have received loans in the absence of BAPCPA and the effects of the change in the composition of borrowers, we employ two techniques: the Blinder-Oaxaca decomposition and propensity score matching.

The Blinder-Oaxaca decomposition was initially developed in the context of wage discrimination, where wages are only observed for individuals who are employed.[87] In the context of this study, we consider the group that was exposed to BAPCPA, that is, borrowers who received loans in the first quarter of 2006.[88] First, we run regressions of the outcome variables on their characteristics for both samples restricted to the *pre* group, which received loans before BAPCPA (in Q1 2005), and the *post* group, which received loans after BAPCPA (in Q1 2006), as in Equations (7.7) and (7.8).

$$(7.7) \quad y_i^{pre} = \beta_X^{pre} X_i^{pre} + \varepsilon_i^{pre}$$

$$(7.8) \quad y_i^{post} = \beta_X^{post} X_i^{post} + \varepsilon_i^{post}$$

An estimate of the difference in average loan terms for the groups due to the changes in the characteristics of the individuals in the group ("endowments") is captured in the first term on the right-hand side of Equation (7.9). An estimate of the effects of the program on the loan terms for individuals who would receive loans in the absence of BAPCPA is captured by the effect due to coefficients in the second term of the right-hand side of Equation (7.9). The effect due to coefficients can be thought of as the change in how the underlying underwriting model classifies borrowers with a certain set of observable characteristics (e.g., a certain credit score).

$$(7.9) \quad \bar{y}^{pre} - \bar{y}^{post} = \beta_X^{pre}\left(\bar{X}_i^{pre} - \bar{X}_i^{post}\right) + \left(\beta_X^{pre} - \beta_X^{post}\right)\bar{X}_i^{post}$$

It follows that for margins, the effect due to the program corresponds to an average of the effects characterized by H2. These results are invariant to omitted reference groups when dummy variables are added; that is, the program effect estimates do not vary with the omitted category when we use indicator variables for the values of a categorical variable as controls.[89] Since Kline has shown that the Blinder-Oaxaca decomposition is a reweighting estimator, we can also interpret the Blinder-Oaxaca results causally.[90]

To further isolate the effect of BAPCPA, we use propensity score matching methods to understand its effect on individuals who received loans after BAPCPA but who, based on their observable characteristics, would have been approved for loans in the absence of BAPCPA. We estimate the effects on this population using nearest-neighbor propensity score matching, matching observations from the first quarter of 2006 with a single observation from the first quarter of 2005. This allows us to reduce the bias due to potential confounding variables.

During this time period, underwriting of student loans was largely based on automated underwriting and primarily based on the characteristics we observe—namely, credit score, amount of loan, and school characteristics. In other words, conditional on borrower and coborrower characteristics, approval for a loan is deterministic because lenders are making decisions based on observable characteristics run through an

algorithm. We thus have reason to believe that propensity score methods are appropriate because our sample satisfies the strong ignorability and conditional independence assumptions in Equation (7.10), where *S* is post-BAPCPA status, as discussed in Rosenbaum and Rubin.[91]

$$(7.10) \quad y_i^{pre} \perp\!\!\!\perp S | X = x, \forall x$$

$$(7.11) \quad \tau = E\left[y_i^{post} | p(x), S = 1\right] - E\left[y_i^{pre} | p(x), S = 0\right]$$

The effect of the program on individuals in the common support of the characteristics of those observed in the pre- and postperiods can be estimated by Equation (7.11), where τ is the treatment effect and p is the propensity score estimated by a probit regression, and $S = 1$ if the individual is observed post BAPCPA and 0 otherwise.[92]

H2 implies that the composition of borrowers may change, owing to the availability of credit to individuals who would not have been offered credit prior to the policy change. Lenders' ex ante assessment of borrower credit quality, x, may be determined by multiple factors, including credit score, school attended, and year in school. Therefore, there may be differences in the observable characteristics of borrowers between the pre- and postperiods. The propensity score analysis thus cannot tell us anything about the type of borrower that is able to get a loan after BAPCPA. It can only tell us the effect of BAPCPA on borrowers in the first quarter of 2006 that would have been approved for a loan before the law changed.

School-level analysis

To test the hypothesis that loan volumes increase because of BAPCPA, H3, we collapse our loan origination data set to the school level. Since our unit of observation is now a school, we are able to use the three methods described above—1) OLS, 2) Blinder-Oaxaca, and 3) propensity-score matching—to examine loan volumes. We also implement a DD strategy using federal loan volumes for comparison.

First we compare the log number of private student loans in the lender data sample at each school in the preperiod to the postperiod. Note that in order to understand the magnitude of the effect, we must exponentiate the coefficients on *post* in the OLS specification and the analogues in the Oaxaca decomposition and the propensity score

matching models. We also run a school fixed effects model in order to consider the within school effects. All models are weighted by full-time equivalent enrollments.

We also perform a DD analysis using available information on the volume of both Direct and FFELP Loans at a given school for the 2004–2005 and 2005–2006 academic years. We assume that in the absence of BAPCPA, the change in PSLs would parallel the change in federal loans and that the change in federal loans is proportional across quarters. We can then estimate the effect of the program on loan volumes using a DD strategy. We believe that our assumption of PSL volume moving in a parallel fashion to federal loan volume in the absence of BAPCPA is likely, since they are subject to the same demand shocks, such as enrollments and changes in tuition costs. Although we do not have quarterly data for federal loans, annual average loans per student grew steadily from 2000 through 2005.[93]

We combine Direct Loan and FFELP Loan totals at the institution-year level, append the resultant data set to the school-level origination data, and merge the appropriate IPEDS and PEPS data at the institution-year level. We then consider PSLs the treated group, so the coefficient of interest is $\beta_{psl\times post}$ in Equation (7.12), and the comparison groups are subsidized and unsubsidized Stafford Loans, Parental PLUS Loans, combined Stafford Loans, and all federal loans. We use a similar strategy to estimate the effects of the program on average loan size at a given school by stacking the loan-level origination data with the Title IV Program Volume Reports and weighting by the number of originations.[94]

$$y_i = \beta_{post} post_i + \beta_{psl} psl_i + \beta_{post\times psl} post_i \times psl_i + \beta_X X_i + \varepsilon_i \tag{7.12}$$

One challenge with using federal loans as controls for PSLs arises from the fact that federal loans have defined maximum loan amounts.[95] This means that loan demand for federal loans is effectively top-coded, which leads to downward bias in estimates of $\beta_{post\times psl}$.[96] As a result, as shown in Appendix 7B, we are likely to underestimate the true effect with the DD analysis.

We make two assumptions in our DD analysis. This is necessary, since data on federal loans are only available at the academic-year level. These assumptions are illustrated in Figure 7.6. First, we assume that all of the federal student loans originated in academic year 2004–2005 are

originated by April 20, 2005. It is likely that the majority of federal loans are originated by this point in time, since the academic year ends at the close of the second quarter, and the law took effect midway through the second quarter. This allows us to associate academic year 2004–2005 with the pre-BAPCPA period and academic year 2005–2006 with the post-BAPCPA period. Second, we assume that at any given institution, the proportion of the academic year's federal loans originated is constant: if *x* percent of academic year 2004–2005 federal loans at school *y* are made in Q1 2005, then *x* percent of academic year 2005–2006 federal loans at school *y* are made in Q1 2006. Similarly, we assume either that the absolute difference or the proportional difference in average federal loan size between quarters is constant within schools across academic years, in the specifications that consider average original balance and log original balance, respectively. Academic year volumes are a noisy measure of quarterly volumes, which means our results are biased toward zero, and the true effect is likely larger than what we observe.[97]

RESULTS

We analyzed the loans originated in the first quarters of 2005 and 2006 using OLS regression, Blinder-Oaxaca decomposition, and propensity score matching. These methods produced similar results displayed in Appendix 7A, Tables 7A.1–7A.5. All of the results we discuss in this section are statistically significant to the 95 percent level or higher unless noted.

Loan-Level Analysis

Table 7A.1 uses OLS to estimate Equation (7.5) for tuition and fees, with various combinations of controls for a borrower's year in school, school type, maximum FICO scores, linear splines for FICO scores, and school fixed effects.[98] Once school fixed effects are introduced, the results are stable across specifications. As predicted by H2, lenders are lending to borrowers who have worse credit after the law changed, as evidenced by the 5.3 point average decrease in FICO scores shown in column (3). Contrary to the prediction from H1 that for a given

credit quality the consumer price of borrowing will decrease owing to increased collections, the margins increase by 30 basis points in column (5). Mean original balance also increased by $1,189.

Because of their credit quality, some applicants would have been able to receive a PSL both before and after BAPCPA. To understand how BAPCPA may have affected the borrower population through changes in underwriting, we turn to the Blinder-Oaxaca decomposition. The results displayed in Table 7A.2 show a 26 basis-point increase in margin but no significant change in loan amount. In column (2) of Panel A, the 0.398 decrease in credit scores due to endowments suggests that some of the characteristics of borrowers may have changed that resulted in average lower FICO scores. This result is statistically significant at the 0.1 level but disappears when school fixed effects are added in column (3). This suggests that the composition of schools to which the sample creditors are lending may have changed and merits further investigation.

Consistent with the OLS results in Table 7A.1, column (5) of Panel B shows a within-school effect of a 35-basis-point increase in margins, 11 basis points of which are attributable to changes in the composition of students (endowments in Blinder-Oaxaca terminology), and 26 basis points of which are attributable to changes in underwriting (coefficients). Recall that we defined r as one plus the rate of return of the loan for the creditor conditional on the borrower repaying their loan. This suggests that for a given set of borrower characteristics, lenders are increasing r, so, inconsistent with the prediction from H1, lenders increased the price of loans in response to BAPCPA.

Similarly, in Panel C, the overall change in original balance due to BAPCPA is insignificant, but changes in borrower characteristics predict a $116 increase in borrowing due to endowments (changes in the composition of students after the law changed).

Table 7A.3 presents the results from the propensity score matching, where the propensity score is calculated by a probit regression of borrower characteristics on whether or not an individual appears in the post-BAPCPA observations. For each specification, the raw difference in means is reported above the difference in means for the matched pairs, labeled as the average treatment on the treated effect. For maximum FICO scores, these results can be interpreted as the type of students, based on schools attended and school year, that the lenders would

have successfully extended credit to pre-BAPCPA. The result in column (3) of a 4.2 point average decrease in FICO scores is consistent with the previous results and suggests that within a given school, lenders are extending credit to individuals with slightly lower credit scores in the postperiod.

For margins and original balances, the results in Table 7A.3 can be interpreted as the effects of the program on the loan terms of individuals who would have been granted loans prior to BAPCPA, based on their characteristics. Consistent with the OLS and Blinder-Oaxaca result, the result in column (5) suggests a 30-basis-point increase in the average margin experienced by a borrower. As also shown in that column, average original balances increased by $1,157 post-BAPCPA.

Overall, these results suggest that credit did expand to some individuals who previously did not have access to private student loans prior to BAPCPA either because of their observable credit quality through their FICO scores or the characteristics of the schools that they attended. This is consistent with H2, and as can be seen from Figure 7.3, it was significant to a number of borrowers with low credit scores. Consistent with the previous methods presented, margins actually increase by a significant amount post-BAPCPA. This is inconsistent with the theoretical prediction of H1 that the price of loans, as captured by the margin, should not increase, since collection given bankruptcy should increase the value of defaulted loans for creditors.

School-Level Analysis

As predicted by H3, when we collapse our data set to the school level, we observe a significant increase in the volume of PSLs after the implementation of BAPCPA. As shown in Table 7A.4, once we control for school characteristics, including tuition and fees, graduation rates, Carnegie classification, log full-time equivalent students, and the percent of the student body that is black and Hispanic, we observe a 174.3 percent increase in PSL originations in the OLS specification in column (6) of Panel A.[99] The corresponding Blinder-Oaxaca decomposition in column (6) of Panel B suggests that a 192.1 percent increase is due to a change in underwriting due to BAPCPA.[100] Similarly, the propensity score matching result yields a 215.2 percent increase in loans due to BAPCPA in column (6) of Panel C.

An OLS regression of log borrowers on BAPCPA with school fixed effects, restricted to students at schools where the creditors issued loans before the policy change, yields an estimate of a 243.0 percent increase in loan volumes. Note that these volumes may be attenuated owing to measurement error and may underestimate the effect of the policy change, since we do not observe other firms that enter due to the construction of the sample.[101]

The DD results for loan volumes in Table 7A.5 are qualitatively similar to estimates in Table 7A.4. With all of our comparison groups, we observe an approximate 60 percent increase in the number of private student loan originations, and a similar increase in the number of distinct borrowers in each loan type. When we compare average original balance to Stafford Loan balances, we observe an effect of the law change of an approximately $600 increase in the average original balance of PSL. This is smaller than our point estimate using other techniques, and we believe that that DD estimate may be biased downward, owing to the loan limits for federal loans.[102]

We add Parent PLUS Loans as comparison in column (4) because they are a close substitute for PSLs, and because PLUS loan eligibility is based on the parents' creditworthiness. Doing so leads us to estimate a $121 decrease in the average size of the PSL. In our sample of PSLs the original rate is negatively correlated with original balance ($\rho = -0.0975$), so it is possible that marginal individuals who would have applied for smaller PLUS Loans in the absence of the policy change make have substituted PSLs for PLUS Loans because of potentially lower interest rates.[103]

DISCUSSION

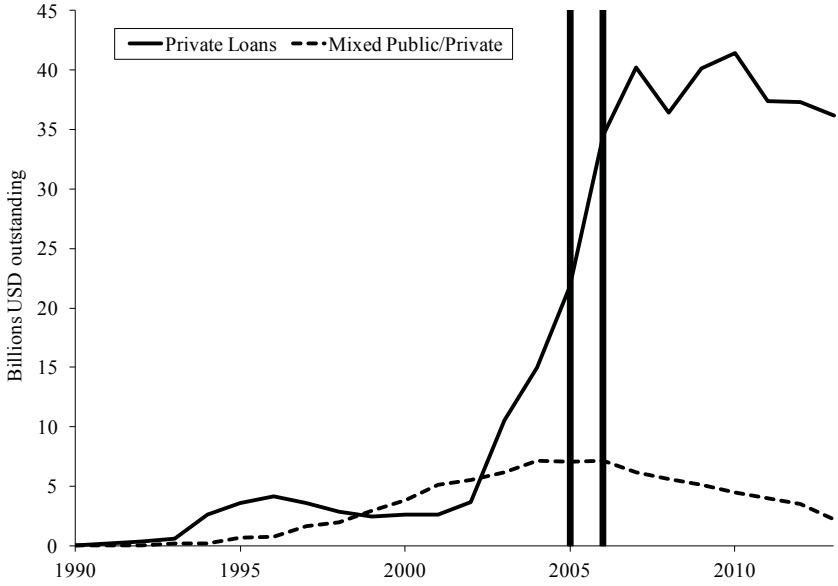
Recall our hypotheses from Table 7.1. While not every model predicted every outcome of interest, those that did were heading in the same direction. Our prediction was that credit would expand; in other words, borrower credit quality would stay the same or decrease, and average loan amounts as well as the volume of loans would stay the same or increase. Our models predicted the prices would either stay the same or decrease. Our results are mostly consistent with these hypoth-

eses: credit expanded among all dimensions after BAPCPA. The first quarter after the law changed saw a dramatic 309 percent increase in the number of loans originated; we estimate that 60 percent of that increase was caused by BAPCPA.[104] Additionally, borrowers with lower credit scores were moderately more able to obtain PSLs as a result of BAPCPA. The decrease in the average maximum credit score was small in magnitude, a drop similar to the effect of applying for two credit cards within a few days. Credit also expanded at the loan level; the average original balance of the loans increased by between $1,100 and $1,400, even after controlling for tuition and fees, year in school, having a coborrower, maximum FICO score, and school fixed effects. All of this is not unexpected. The most surprising finding of our study is that contrary to our hypotheses, both from the point of view of reform proponents and opponents, average loan prices (in our parlance, lender margins) *increased* during this period.[105] Our estimates show that margins increased by between 30 and 40 basis points, even for students who would have received a loan before BAPCPA.

An expansion of credit coupled with an increase in price sounds eerily similar to what happened in other consumer credit markets during the pre-Great Recession bubble. The secondary market for all consumer credit—mortgages, credit cards, auto loans, etc.—increased dramatically before the Great Recession. Consumer credit ABS issuances peaked before 2005, but it is widely theorized that, securitization demand drove both an expansion of credit as well as an increase in prices in markets such as housing.[106] One potential story here is that we are not observing BAPCPA so much as securitization demand. This account would be consistent with Block-Lieb and Janger's prediction that lenders would not relax underwriting standards or originate more loans after BAPCPA because they had no reason to expect increased charge-offs after the law changed.[107] If BAPCPA did not cause shifts in supply, then lenders would have only relaxed their underwriting criteria in order to meet the demand from the securitization market. We cannot discount that securitization had an effect on our findings; however, as we discuss below, we find evidence that is inconsistent with this hypothesis.

As shown in Figure 7.7, PSL Asset Backed Securities (PSLABS) outstandings increased in a steep linear fashion between 2003 and 2007. We note that the growth in outstandings in the period we studied (repre-

Figure 7.7 Outstanding Private and Mixed Private/Public Student Loan Asset Backed Securities



SOURCE: U.S. ABS Issuance and Outstanding, Securities Industry and Financial Markets Association (see Note 108).

sented by the vertical lines in Figure 7.7) is similar to that in the period that came before it (2004–2005) and after 2006–2007. In other words, PSLABS were increasing steadily between 2003 and 2007.

Given this stable increase, we compare our results among our four outcomes of interest (maximum FICO score between borrower or coborrower, margin charged on the loan, original balance of the loan, and the volume of loans originated) between the first quarters straddling bankruptcy reform (Q1 2005 to Q1 2006) and the same quarters one year after reform (Q1 2006 to Q1 2007).[109] Table 7.4 reports the raw means for the three periods.[110] Credit expands the year after the law changes (2006–2007), but the growth is much more muted than in the period spanning bankruptcy reform. For example, between Q1 2006 and Q1 2007, the mean maximum FICO score decreased one point; noticeably less than the five-point decrease after BAPCPA. Similarly,

Table 7.4 Raw Means of Outcomes of Interest in the First Quarters of 2005, 2006, and 2007

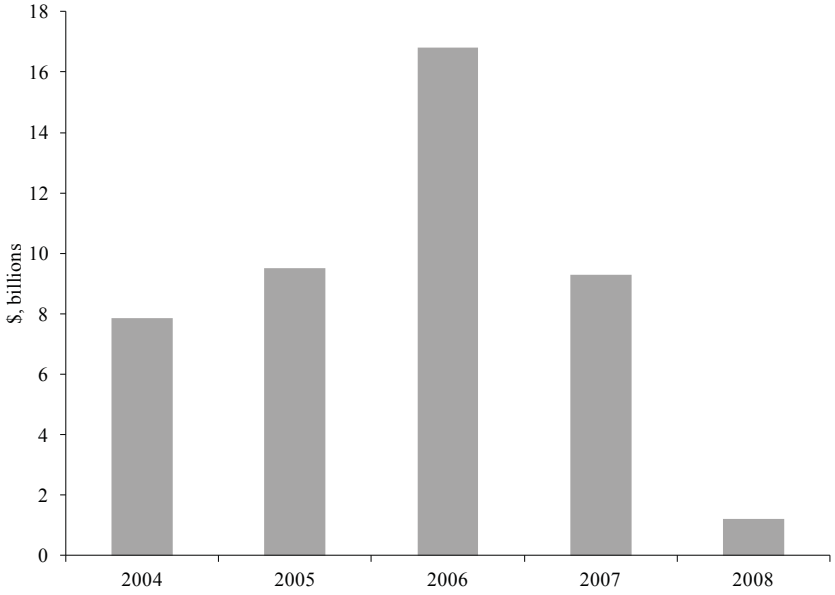
	Q1 2005	Q1 2006	Q1 2007
	Mean	Mean	Mean
Maximum FICO score	720	715	714
Margin (%)	4.2	4.6	5.1
Original balance ($)	8,614	10,015	10,147
Loans originated	4,960	15,318	19,658

loan volumes increased 128 percent between Q1 2007 and Q1 2006, but this is not the astounding 309 percent increase we observe between Q1 2005 and Q1 2006. Continuing the puzzling trend, margins increased 50 basis points between the first quarter of 2006 and the first quarter of 2007.

If securitization were a principal driver of the expansion of credit we observe between before and after bankruptcy reform, we would expect similar effects in the cost and availability of credit between the bankruptcy reform period (2005–2006) as well as the period after (2006–2007). That is not what the data show: the changes in borrower composition and the spike in loan volumes are quite pronounced in the period around bankruptcy reform, while not nearly as much in the same period one year later.

Figure 7.7 depicts securitizations outstanding, which are necessarily cumulative. Figure 7.8 presents annual PSLABS issuances, which is a closer analogue to loan originations—closer but with one caveat. When comparing securitization issuances and loan originations, it is important to consider that PSLABS issuances necessarily lag originations. This is because it takes some time to package and securitize loans that are made during a particular time period. In addition, the typical securitization trust contains loans originated during multiple years as part of the risk spreading investors require. The "youngest" loans included in a portfolio of PSLABS were typically originated 3–6 months prior to the issuance of the securities.[111] Because of this lag, if the secondary market was the reason for the large expansion of credit we observe in the time period around bankruptcy reform (and not BAPCPA), we should observe an increase in securitizations in 2005 (or before) relative to later years. The expected increase should attenuate in 2006 and later

Figure 7.8 Issuances of Private Student Loan Asset Backed Securities Peaked in 2006 before Declining Dramatically during the Great Recession



SOURCE: CFPB PSL report (see Note 112).

to account for the "cooling off" in credit expansion that we discussed above. We observe the opposite. As shown in Figure 7.8, securitization issuances spike in 2006, the year immediately *after* BAPCPA became effective.

Because of the lag in issuing securities, PSLABS packaged and offered to investors in 2006 were primarily made up of loans originated before bankruptcy reform. Regardless of when these loans were originated, however, when BAPCPA became effective on October 17, 2005, all private student loans became presumptively nondischargeable and thus more valuable to investors. It is thus not surprising to observe a spike in securitization issuances in 2006 as shown in Figure 7.8 and a corresponding faster increase in PSLABS outstanding between 2005 and 2006, as shown in Figure 7.7. The expected recovery of PSLs was higher now that they (effectively) could not be discharged in bank-

ruptcy. This likely increased the demand for PSL securities from the secondary market but only after BAPCPA was enacted.[113] This latter increased demand, however, could not be the cause of what we observe during the 2005–2006 period.

Demand for PSLABS was progressively increasing well before BAPCPA was enacted. It is likely responsible for expansion of the PSL market.[114] However, a steady expansion of PSLABS from 2003–2007 and a spike in PSLABS issuances in 2006 (which necessarily included few loans originated post-BAPCPA) are inconsistent with a hypothesis that the sudden expansion of credit we observe between Q1 2005 and Q1 2006 (around bankruptcy reform) was caused by securitization. Instead, what we know about securitization volumes in the period during this time is more consistent with a story that bankruptcy reform further stoked the fires of the secondary market, leading to the peak in PSLABS issuances in 2006.

If securitization does not explain the expansion of credit we observe, then what accounts for the puzzling increase in margins? One plausible explanation is that the increased prices are driven by lender advertising. We've reported evidence that the composition of borrowers changed after BAPCPA: in other words, credit expanded to borrowers who would not have received loans before the law changed. The data also show that borrowers who would have received loans before BAPCPA obtained loans in increasing numbers after the law change.

There is reason to think that advertising might have been well targeted to the relevant population. Advertisements for PSLs could have come through regular channels (such as television, direct mail, and the Internet). Lenders could have also targeted students directly. During this period, the lenders in our study were part of FFELP and were federal as well as private student loans. If a student had applied for a FFELP loan from a lender, they would have some information about both the appetite and credit profile of the student, not to mention their contact information. Armed with this knowledge, the lender could reach out directly to students and promote their PSL product. This focused advertisement would lead to increased student demand for PSLs, which would have driven up the cost of the loans. There is anecdotal evidence of a growth in direct-to-consumer marketing during this time period and continuing for a few years.

We need much more information than we have available to test this theory. Ideally, we would have some data on advertising trends over time. We would also really want to have data on how margins were changing before 2005. It seems plausible that lenders began trying to fan demand as a result of securitization before BAPCPA. In that case, BAPCPA may have further increased marketing efforts. The increase in margins that we observe may be part of a broader trend that continues in the period one year after bankruptcy reform; potentially a lagging result of the increase in advertisement the previous year. Regrettably, the data available do not allow us to corroborate these suppositions.

As a final note, we briefly discuss the potential welfare effects of bankruptcy reform vis-à-vis PSLs. Our data do not allow us to draw conclusions about whether the expansion of credit was welfare-enhancing. Robert Lawless and others have noted that a rapid expansion of credit is usually correlated with increased bankruptcy filings.[115] Comparing PSLs to loans issued by nonprofit institutions, the CFPB found that "more careful underwriting ([by nonprofits] relative to [PSL] lenders) reduced default rates."[116] It is worth remembering, however, that in terms of less-than-prime borrowers, the credit expansion we observe was modest: the effect on the average credit score was the same as applying for multiple credit cards within a short period.

Arguably, however, an expansion of credit is precisely what supporters of the special treatment for PSLs intended. As then Representative Lindsey Graham (R-SC) stated during the 1999 debates arguing for the passage of the law:

> There is a growing industry in the private sector. There is a $1.25 billion loan volume for where private lenders who will loan money to students for their college expenses as the federally guaranteed program does not in every occasion meet the needs of the student, and we are trying to give the private lender the same protection under bankruptcy that the federally guaranteed loan program has and nonprofit organizations have. We are trying to make sure they are [*sic*] available loans, loans are available to students to meet their financial needs, and this would have a beneficial effect, make sure that the loan volume necessary to take care of college expenses are available for students . . . [117]

The congressional record is bare of any other explanations for the purpose of the special treatment of PSLs. John Pottow has theorized

that nondischargeability can be justified "as an attempt to make private loans 'cheaper' for students" and to create a "a robust private lending market . . . a bountiful capital supply available for loans."[118]

A bountiful capital supply was indeed available for loans immediately after BAPCPA, although the capital supply disappeared almost as quickly as it had appeared. After growing 20 percent per year between 2005 and 2007, PSL originations in our sample peaked at $10.1 billion and dropped to pre-2005 levels in 2010–2011.[119] Of course, other intervening factors likely played a role here, the Great Recession and credit crunch in particular. Nonetheless, it is important to note that a law's purported positive effects (increasing availability of credit) may be short lived, while its potential negative ones (nondischargeability in bankruptcy) continue on.

The increase in the risk premium lenders charge for a loan, on the other hand, does not seem welfare enhancing to borrowers. A 35-basis-point increase in the price of a $10,000 15-year loan can translate to an added cost to the borrower of almost $25 per year or $365 over the life of the loan.[120] This increase becomes more significant when one considers that the lenders in the sample made an additional 10,358 loans in the postperiod. If we take our $25 per year increase as an average for all loans, this would mean that BAPCPA may have cost student borrowers an additional $382,950 per year in the first quarter of 2006.[121]

CONCLUSION

The 2005 amendments to the Bankruptcy Code were a watershed moment almost a decade in the making. Proponents of bankruptcy reform blamed rapidly rising bankruptcy filings on strategic consumers using the Bankruptcy Code to escape their debts. They argued that reform was necessary to prevent strategic borrower behavior and reduce the cost of consumer credit. Opponents of the proposed bankruptcy reforms pointed to the dearth of data supporting the strategic consumer story and instead cited behavioral experiments establishing consumers' less-than-perfect rationality and empirical evidence that the majority of bankruptcy filers had very low income and few assets. Opponents predicted that there would be no discernible change in the

cost of consumer credit or loan volumes. In this chapter, we developed and tested theoretical models predicting the effects of the part of the law change on PSLs granted to students at four-year undergraduate institutions.[122] Using a unique data set of PSL originations before and after the law change, we tested those predictions using OLS regression, Blinder-Oaxaca, matching, and DD methods.

Some of our findings are unsurprising: the law change caused a moderate expansion of credit for less creditworthy borrowers, although the average borrower credit score decreased only slightly in practical terms. Loan volumes also tripled; we attribute 60 percent of that increase to the law change. Contrary to our hypotheses, however, we find that the overall cost of private student loans at four-year undergraduate institutions increased by an average of 35 basis points as a result of the law change. We posit that the larger cost may have been driven by increased demand for PSLs from students as a result of lender advertising. We speculate that the increased marketing may have started before BAPCPA.

Our analysis so far suggests that this is a story about distributions—that is, that certain students may have seen an increase in the cost of their loans and others might have seen a decrease. In future work, we intend to investigate the variation in credit quality and margins to see whether the effect of BAPCPA was different across types of schools (e.g., higher versus lower prestige); types of borrowers (e.g., prime versus subprime); or types of loans (e.g., those marketed through the school versus those marketed directly to the consumer).[123] We expect that this will give us a more complete picture of the effects of BAPCPA.[124]

Notes

This chapter conforms generally to the Bluebook legal style of citation. For the latest edition, see *The Bluebook: A Uniform System of Citation*, 19th ed. (Cambridge, MA: Harvard Law Review Association, 2010).

1. Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), Pub.L. 109–8, 119 Stat. 23 (2005).
2. In 1999 and 2000, the House and Senate passed bills that were vetoed by President Clinton. *Clinton vetoes bankruptcy bill*, Associated Press, Dec. 20, 2000, *available at* http://lubbockonline.com/stories/121900/upd_075-5725.shtml; 145 Cong. Rec. H2655-02 (daily ed. May 5, 1999) (statement of Rep. Conyers).

3. For more information on the history and motivation of BAPCPA, *see* Susan Block-Lieb & Edward J. Janger, *The Myth of the Rational Borrower: Rationality, Behavioralism, and the Misguided "Reform" of Bankruptcy Law*, 84 Tex. L. Rev. 1481, 1483 (2006).
4. *Id.* at 1562.
5. *See, e.g.,* Section 439A of the Higher Education Act, codified at 20 U.S.C. 1087-3 (1976); 11 U.S.C. 523(a)(8) (1979) (Pub.L. 96-56, § 3 (1979)); 11 U.S.C. 523(a)(8) (1990) (see Pub.L. 101-647, § 3621(1) (1990)); 11 U.S.C. 523(a)(8) (1998) (see Pub.L. 105-244, § 971(a) (1998)).
6. The first policy prescribes that similarly situated creditors not receive an advantage over others—sometimes termed "equity is equality"—for our purposes, unsecured creditors are all asked to share the loss equally. The second policy prescribes that the debtor should exit bankruptcy unshackled from the debts that were weighing down her economic productivity, or in bankruptcy parlance, that the debtor receive a "fresh start," or a discharge of her debts. *See, e.g.*, Rafael I. Pardo & Michelle R. Lacey, *Undue Hardship in the Bankruptcy Courts: An Empirical Assessment of the Discharge of Educational Debt*, 74 Univ. of Cin. L. Rev. 405, 413-419 (2005) [hereinafter Pardo & Lacey (2005)]; National Bankruptcy Review Commission, Bankruptcy: The Next Twenty Years 179 (1997), *available at* http://govinfo.library.unt.edu/nbrc/report/07consum.pdf.
7. An Act to establish a uniform system of bankruptcy in the United States, 30 Stat. 544 Section 17 (July 1, 1898). Exceptions to discharge have also been added for various kinds of fraud or false representations or violations of the law. *See, e.g.,* 11 U.S.C. §§ 523(a)(2), (a)(4), (a)(6), (a)(9), (a)(11), (a)(12), (a)(13) & (a)(19). Many are also concerned with excepting taxes or duties owed to a state or federal entity. *See, e.g.*, 11 U.S.C. §§ 523(a)(1), (a)(7), (a)(11), (a)(12), (a)(14), (a)(14A), (a)(17), (a)(18) & (a)(19). The stated reason for the change here was the possibility for fraud and strategic filing by debtors seeking to start their postgraduation career without any student loans.
8. 11 U.S.C. §§ 523(a)(5), (a)(15). 108 Cong. Rec. H156 (2004) (statement of Rep. Cantor). Senator Sessions also stated that the bill would "also provide[ ] tremendous benefits for women and children." 109 Cong. Rec. S1915 (2005) (statement of Sen. Sessions).
9. *What are the main differences between federal student loans and private student loans?* Consumer Fin. Prot. Bureau (July 26, 2013), http://www.consumerfinance.gov/askcfpb/545/what-are-main-differences-between-federal-student-loans-and-private-student-loans.html.
10. In our sample, 80 percent of student borrowers in Q1 2005 applied with a coborrower. That proportion had risen slightly to 82 percent in Q1 2006. Federal loans have no cosigners, but Federal PLUS Loans are available to parents of undergraduates who qualify for federal loans.
11. See Appendix Figure 1 at page 96 of the CFPB PSL Report for a graphical representation of the various indices used to calculate PSL interest rates from 2004–2012. Most federal loans are fixed rate. Consumer Fin. Prot. Bureau, Private Stu-

dent Loans 96 (2012), http://files.consumerfinance.gov/f/201207_cfpb_Reports_Private-Student-Loans.pdf [hereinafter CFPB PSL Report].

12. *Id.* at 12. By comparison, rates for federal student loans that did not require cosigners in 2011 were either 4.5 percent or 6.8 percent fixed, depending on the type of loan. A 4.5 percent fixed rate was available for undergraduate students taking out a subsidized Stafford Loan; 6.8 percent was available for undergraduate unsubsidized Stafford Loans and for graduate student subsidized and unsubsidized Stafford Loans. FinAid, Historical Interest Rates, http://www.finaid.org/loans/historicalrates.phtml. The federal loan program has had multiple instances where loans were offered as variable rates but has always had a cap of 8.25 percent APR for Stafford Loans and 9 percent for PLUS Loans. *Id*.
13. Federally insured Stafford Loans issued by banks were also securitized during this time period. CFPB report at 17-18. For an explanation of asset-backed securitization, see CFPB report at 104.
14. There was no "consumer rebate."
15. Rohit Chopra, *Student Debt Swells, Federal Loans Now Top a Trillion*, Consumer Fin. Prot. Bureau (July 17, 2013), http://www.consumerfinance.gov/newsroom/student-debt-swells-federal-loans-now-top-a-trillion.
16. *Income-Based Plan | Federal Student Aid*, Fed. Student Aid, http://studentaid.ed.gov/repay-loans/understand/plans/income-based (accessed Apr. 11, 2014).
17. For a full list, see *Forgiveness, Cancellation, and Discharge | Federal Student Aid*, Fed. Student Aid, http://studentaid.ed.gov/repay-loans/forgiveness-cancellation#death-discharge (accessed Apr. 11, 2014).
18. *Id*. at 10.
19. Department of Education, Default Rates: Cohort Default Rates 2005-09, http://ifap.ed.gov/eannouncements/010512DefaultRates20052009.html.
20. CFPB PSL Report, *supra* note 11, at 64-65.
21. *Id.* at 64.
22. *Id.*
23. *See* Dodd-Frank Wall Street Reform and Consumer Protection Act § 1035, Pub. L. 111-203 (2010).
24. Pardo & Lacey, *supra* n. 6, at 427; *see id.* at note 112 and 113 for citations to illustrative cases.
25. The GAO found that despite a general default rate on educational loans of 18 percent, less than 0.75 percent of all education loans were discharged in bankruptcy. H.R. Rep. No. 95-595, at 132 (1977), reprinted in 1978 U.S.C.C.A.N. 5963, 6094. The GAO also found that the majority of students were not filing for bankruptcy immediately upon graduation. The average time between when a student obtained a loan and when they filed for bankruptcy in the GAO sample was 41 months. *Id.* at 6103-04. In addition, lucrative careers were not significantly represented among those who sought to discharge their student loans. While 72 percent of the individuals who discharged student loans in the GAO sample were employed, the top occupations were teacher (10 percent), clerk (8 percent), salesman (6 percent), housewife (5 percent), and student (4.5 percent). *Id*. Also, the individuals seeking

the protection of the bankruptcy laws were not particularly well off. The average earnings for the individuals studied for the year prior to filing for bankruptcy were $5,361 in 1977 dollars ($20,787.42 today). *Id.* at 6105.

26. 11 U.S.C. § 523(a)(8) (2005).
27. The design of bankruptcy protections for student loans has clear welfare implications: in 2011, Felicia Ionescu modeled the effect of alternative bankruptcy regimes for federal student loans under uncertainty about college completion and future earnings, and concluded that nondischargeability benefits high ability, low income students, and that welfare effects differ by bankruptcy regime. Felicia Ionescu. *Risky Human Capital and Alternative Bankruptcy Regimes for Student Loans*, 5 J. Human Capital 153 (2011).
28. H.R. Rep. No. 95-595, at 154-55 (1977), reprinted in 1978 U.S.C.C.A.N. 5963, 6115-16 (section 439A, effective September 30, 1977). Representative Edwards advised that "[i]f the exception to discharge is to be enacted, we must provide for a more definite standard that will not encourage forum shopping." *Id*. That, unfortunately, did not happen.
29. *See* Higher Education Amendments of 1976, Pub. L. 94-482 § 439, 90 Stat. 2081 (Oct. 12, 1976)(section 439A, effective September 30, 1977); 11 U.S.C. § 523(a)(8) (1979) (Pub.L. 96-56, § 3 (1979)); 11 U.S.C. 523(a)(8) (1990) (see Pub.L. 101-647, § 3621(1) (1990)); 11 U.S.C. 523(a)(8) (1998) (see Pub.L. 105-244, § 971(a) (1998)); 11 U.S.C. 523(a)(8) (2005) (see Pub.L. 109-8, § 220 (2005)). For an empirical account of undue hardship determinations made by bankruptcy courts arguing that the legal outcomes in the determination of undue hardship can be best explained by "differing judicial perceptions of how the same standard applies to similarly situated debtors," see Pardo & Lacey (2005), *supra* note 6, at 486.
30. Brunner v. N. Y. State Higher Educ. Servcs. Corp., 831 F. 2d 395 (2d Cir. 1987). This is a three-part test; the debtor is required to meet all parts:

    > (1) That the debtor cannot maintain, based on current income and expenses, a "minimal" standard of living for herself and her dependents if forced to repay the loans; (2) that additional circumstances exist indicating that this state of affairs is likely to persist for a significant portion of the repayment period of the student loans; and (3) that the debtor had made good faith efforts to repay the loan.

    Id. at 396. At least one court has referred to the standard as the "certainty of hopelessness." Daniel A. Austin, *Student Loan Debt in Bankruptcy: An Empirical Assessment* at 5 (May 27, 2014)(forthcoming Suffolk U. L. R.), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2442312 (quoting In re Roberson, 999 F. 2d 1132 (7th Cir. 1993)). Note, however, that recently some courts seem to be relaxing the standard. *Id.*
31. *See* Fed. R. Bankr. Proc. 7001; Jason Iuliano, *An Empirical Assessment of Student Loan Discharges and the Undue Hardship Standard*, 86 Am. Bankr. L. J. 495, 496 (2012).
32. United Student Aid Funds v. Espinosa, 559 U.S. 260 (2010).
33. In other words, the loans continue to accrue interest and fees while the individual

is in bankruptcy and she is still liable for all that the contract obligates her to pay even after she receives her bankruptcy discharge.

34. Iuliano, *supra* note 31, at 504-05.
35. *Id.* Using a different sampling protocol drawing from cases between 2005 and 2013 in 10 judicial districts, Daniel Austin estimates that less than 0.33 percent of individuals with student loans seek to discharge them in bankruptcy. *See* Austin, *supra* n. 30, at 5.
36. Pardo and Lacey's 2005 study offered the very first empirical evidence of outcomes in undue hardship cases. The study suffered from serious limitations, since it was based on published judicial opinions, rare and nonrandom events in themselves, and was composed of only cases that went to trial and produced a published opinion. Not all trials produce a published opinion and not all attempts to discharge student debt go to trial. Pardo & Lacey (2005), *supra* note 6. Their 2009 study examined a data set of 115 student-loan discharge proceedings—for both private and federal loans—that were filed between 2002 and 2006 in the Western District of Washington. Rafael I. Pardo and Michelle R. Lacey, *The Real Student Loan Scandal: Undue Hardship Discharge Litigation*, 83 Am. Bankr. L. J. 179, 200 (2009) [hereinafter Pardo & Lacey (2009)].
37. *See* Iuliano, *supra* note 31, 509 (mean age 49 and median 48.5); Pardo & Lacey (2005), *supra* note 6, at 442-43 (mean 41.5, median 41); Pardo & Lacey (2009), *supra* note 36, at 204 (mean: 45; median not reported).
38. Iuliano, *supra* note 31, at 508 (68 percent unmarried, 46 percent had dependents); Pardo & Lacey (2005), *supra* note 6, at 445-47 (62 percent unmarried, 56 percent had dependents); Pardo & Lacey (2009), *supra* note 36, at 204 (80 percent unmarried, 38 percent had dependents).
39. *See* Iuliano, *supra* note 31, at 508 (60 percent of discharge seekers were employed versus 81 percent of the overall bankruptcy population); Pardo & Lacey (2009), *supra* note 36, at 204 (58 percent were employed).
40. Iuliano, *supra* note 31, at 511.
41. Pardo & Lacey (2005), *supra* note 6, at 474 (mean: $47,137); Iuliano, *supra* note 31, at 510 (mean: $80,746). *See also* Pardo & Lacey (2009), *supra* note 36, at 207 (mean: $76,139).
42. Iuliano, *supra* note 6, at 518 (52 percent); Pardo & Lacey (2009), *supra* note 36, at 204 (55 percent).
43. Pardo & Lacey (2005), *supra* note 6, at 477.
44. Pardo & Lacey (2009), *supra* note 36, at 184.
45. Iuliano, *supra* note 31, at 505. Most of those discharges came about as a result of a settlement with a student loan creditor (56 cases or 69 percent of all debtors who obtained relief). Only in 22 percent of cases in which a debtor obtained a partial discharge or more did the bankruptcy judge make a determination that the debtors satisfied the undue hardship standard. *Id.* at 512.
46. Pardo & Lacey (2005), *supra* note 6.
47. *Id.* at 433.
48. Pardo & Lacey (2009), *supra* n. 36, at 185.
49. Mark Krantowitz, FinAid.org, Impact of the Bankruptcy Exception for Private

Student Loans on Private Student Loan Availability (Aug. 14, 2007), http://www.finaid.org/educators/20070814pslFICOdistribution.pdf.

50. *Id*. at 2.
51. Krantowitz's data came from PSLs included in the prospectuses of asset backed securitizations (student loan asset backed securities, or SLABs for short) done between 2002 and 2007. Krantowitz, *supra* note 49 at 1. One issue with Krantowitz's analysis is that one of the SLABs examined included loans that may have been nondischargeable before BAPCPA because of the involvement of a nonprofit entity. In the case of one of the SLABs examined in the report, First Marblehead, the loans were guaranteed by The Education Resources Institute, or TERI, a national nonprofit. *Id*. at 5. It is not entirely unclear that these loans would have been nondischargeable prior to BAPCPA, *id.*, but the uncertainty can also cloud the results
52. *Id*. at 4.
53. *Id*.
54. *Id*. at 5. The report noted that the prospectuses for the SLABs examined did not disclose any change in underwriting criteria for loans originated after BAPCPA. *Id.*
55. Block-Lieb & Janger, *supra* note 3, at 1511-14. *See also* Marquette Nat'l Bank of Minneapolis v. First of Omaha Service Corp., 439 U.S. 299 (1978).
56. *Id.* at 1484 (citing 151 CONG. REC. S1813, S 1842 (daily ed. Mar. 1, 2005) (statement of Sen. Hatch insisting that there is a "bankruptcy tax" of "$400-a-year on every household in the country," which could amount to a "mortgage or a rent payment" for many families).
57. *Id.*
58. *Id.* citing Posting of Richard Posner to Becker-Posner Blog, http://www.becker-posner-blog.com (Mar. 27, 2005, 02:20 PM) ("If bankruptcy is more costly, there will be less of it.").
59. In other words, r can be thought of as the present discounted value of the flow of payments made by a borrower who follows the repayment schedule. Therefore, for a given loan term and conditions, a higher value of r implies a higher interest rate for borrowers.
60. This includes partially paid loans for which the remaining outstanding balance is sent to collections.
61. "To model decision-making under uncertainty, almost all game theory uses the theories of von Neumann and Morgenstern (1944) and of Savage (1972). That is, if the consequence function is stochastic and known to the decision-maker . . . then the decisionmaker is assumed to behave as if he maximizes the expected value of a [utility] function . . ." Martin Osborne and Ariel Rubinstein. *A Course in Game Theory 5* (1994).
62. We would expect BAPCPA to diminish the opportunity for strategic default, even if there was rampant strategic behavior pre-BAPCPA.
63. Note that neither the shift in demand nor supply need be parallel. Consider the case where $\hat{v}(z,r) = v(kz,r)$ where k is a constant. Then $\frac{dz}{dk}$ is a function of r, so shifts

do not have to be parallel. It follows from Equation 7.3 that shifts in supply also do not have to be parallel.

64. Joseph E. Stiglitz and Andrew Weiss. *Credit Rationing in Markets with Imperfect Information*, 71 Am. Econ. Rev. 393 (1981).
65. This assumption is based on our informal understandings of the market. More research is needed.
66. A number of scholars have argued that the Stiglitz-Weiss model is no longer applicable in a world of sophisticated credit scoring models, and "big data" number crunching lenders can differentiate between good and bad risks and thus can price products according to risk. Risk-based pricing is very much alive in the context of PSLs and can be seen in our data. *See* Block-Lieb & Janger, *supra* note 3 and Kathleen C. Engel and Patricia A. McCoy, *A Tale of Three Markets: The Law and Economics of Predatory Lending*, 80 Texas L. Rev. 1255 (2002).The rise of the securitization market has also been cited as a reason why credit rationing may no longer occur as in the Stiglitz-Weiss model, given that there is more capital available to lenders. *See generally* Engel and McCoy. In any event, the Stiglitz-Weiss model predictions are very similar to the competition model above. The primary difference is that the Stiglitz-Weiss model predicts that loan pricing (lender margins) should remain the same for originations after the law change.
67. Block-Lieb & Janger, *supra* note 3.
68. Students may be unaware of the law change or what it means for their private student loans or they may suffer from a number of other behavioral biases other than present bias, such as optimism bias or probability neglect. Cass Sunstein, *Probability Neglect: Emotions, Worst Cases, and Law*, 112 Yale L. J. 61 (2002).
69. Block-Lieb & Janger, *supra* note 3 at 1562.
70. We consider the Block-Lieb hypothesis to be a distinct model even though it can be described as a subset of the CP model.
71. CFPB PSL Report, *supra* note 11.
72. *Id.* at 7. "The participating lenders included: RBS Citizens N.A., Discover Financial Services, The First Marblehead Corporation, JPMorgan Chase Bank, N.A., PNC Bank, N.A., Sallie Mae, Inc., SunTrust Banks, Inc., U.S. Bank National Association, and Wells Fargo Bank, N.A.." *Id.* at 109.
73. Most of the PSLs in the data set had variable interest rates that varied according to an index, such as LIBOR or the Prime Rate. The "margin" on those loans is the premium "added to the current index value to determine the total interest rate for the loan. The margin is set at the time of origination and varies based on the credit worthiness of a borrower. This variation in margin value is one way that a creditor might establish 'risk-based' pricing." *Id.* at 108.
74. Details of this merge are described *id.* at 93-95.
75. *The Integrated Postsecondary Education Data System – About IPEDS*, Institute of Education Sciences, http://nces.ed.gov/ipeds/about/ (accessed Apr. 11, 2014).
76. *Id*.
77. *Postsecondary Education Participants System (PEPS) homepage*, Fed. Student Aid, http://www2.ed.gov/offices/OSFAP/PEPS/index.html (accessed Apr. 11, 2014).

78. "Title IV" refers to the part of the Higher Education Act of 1965 that covers the administration of federal financial aid programs. *Title IV Program Volume Reports | Federal Student Aid*, Fed. Student Aid, http://studentaid.ed.gov/about/data-center/student/title-iv (accessed Apr. 11, 2014). The Federal Family Education Loan Program (FFELP) was in effect from 1965–2010 and was a public-private partnership whereby private lenders would originate federal loans. It was eliminated in 2010 when it was projected it would save $68 billion over 11 years. Tracey D. Samuelson, *Student Loan Reform: What Will It Mean For Students?* Christian Sci. Monitor (Mar. 30, 2010), *available at* http://www.csmonitor.com/Business/2010/0330/Student-loan-reform-What-will-it-mean-for-students.
79. We do this because changes in the rules for federal loans might lead to changes in the demand for federal student loans or PSLs not due to BAPCPA and it would be impossible to disentangle them. United States Department of Education. Dear Colleague Letter (Apr. 27, 2006), http://ifap.ed.gov/dpcletters/attachments/GEN0605.pdf (accessed June 6, 2014).
80. Associated Press, *supra* note 2.
81. Editorial, *Banks Win, You Lose,* Wilmington Star-News, Mar. 10, 2005, at 8A. *But see* Michele Heller, *Bankruptcy Bill Backers Not Quite Ready to Party*, American Banker, Apr. 1, 2005.
82. Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), Pub.L. 109–8, 119 Stat. 23 (2005).
83. To the extent that lenders made changes to their underwriting criteria in anticipation of the law taking effect, the effects that we report should be interpreted as smaller than the true effect.
84. While the lender data also contain information about the initial interest rate disclosed to the borrower, the salient measure to lenders is their returns from the loan net of their cost of funding, which is more closely described by the margin over the index, since the index is likely chosen to correspond to the index of the source of funding.
85. Discussions with industry participants suggest that private student loans over the 2005–2011 period were underwritten based on the highest credit score among borrowers and coborrowers.
86. The constant is subsumed in X_i.
87. *See* Alan S. Blinder, *Wage Discrimination: Reduced Form and Structural Estimates*, 8 J. Human Resources 436 (1973); Ronald Oaxaca, *Wage Differentials in Urban Labor Markets*, 14 Int'l Econ. Rev. 693 (1973).
88. This group is an analogue to the minority group in the Blinder-Oaxaca decomposition.
89. Ronald Oaxaca & Michael Ransom, *Identification in Detailed Wage Decompositions,* 81 Rev. Econ. & Statistics 154 (1999).
90. Paul Rosenbaum & Daniel Rubin, *The Central Role of the Propensity Score in Observational Studies for Causal Effects*, 70 Biometrika 41 (1983).
91. *Id.*
92. Support is defined in the statistical sense; the common support is the set of covariate values that are in the distribution of covariate variables of both the treated and control group.

93. *See Trends in Student Aid,* 2013. *College Board.* http://trends.collegeboard.org/sites/default/files/student-aid-2013-full-report.pdf (accessed June 3, 2014).
94. *See Title IV Program Volume Reports*: *Federal Student Aid*, Fed. Student Aid, http://studentaid.ed.gov/about/data-center/student/title-iv (accessed Apr. 11, 2014).
95. For example, during the sample period the annual Stafford Loan limits were $2,625 for dependent freshmen, $3,500 for dependent sophomores, and $5,500 for upperclassmen. PLUS Loans were limited to cost of attendance minus the expected family contribution. Borrowers qualify for subsidized Stafford Loans based on financial need.
96. See Appendix 7A for additional detail.
97. *See generally* Steve Pischke, Lecture Notes on Measurement Error (Spring 2007), http://econ.lse.ac.uk/staff/spischke/ec524/Merr_new.pdf (accessed July 27, 2014).
98. School fixed effect is simply a dummy variable for each school. Sample sizes may increase between specifications 2 and 3 because the school fixed effect is from the lender data sample, whereas the school type is from the merge with the PEPs data, and tuition and fees are imputed from the merge with IPEDS.
99. This is obtained from subtracting 100 percent from the 274.3 percent marginal effect.
100. As above, we attribute the change to a change in underwriting standards for a given type of students, to the effect due to coefficients in a Blinder-Oaxaca decomposition.
101. This corresponds to a coefficient on postperiod of 1.233. A back-of-the-envelope calculation yields that 92 percent of the threefold increase in PSL origination volume in the first quarter of 2006 can be explained by the law change.
102. It is also important to note that we do not observe changes in school aid.
103. Parent PLUS loans in this period were fixed at 4.17 percent in the 2004–2005 academic year and 6.10 percent in the 2005–2006 academic year for credit-worthy parents, whereas PSLs offered were typically variable rate loans and had initial rates of as much as 19 percent for the riskiest borrowers. *See Interest Rates on the Federal PLUS Loan*, ParentPlusLoan.com, http://www.parentplusloan.com/plus-loans/plus-loan-interest-rate.php (accessed June 9, 2014).
104. At the same time, PSL asset-backed securities (PSLABS) also increase two-fold, going from just under $8 billion to over $16 billion dollars between 2005 and 2006. CFPB PLS Report, *supra* note 34, at 18.
105. H_0 predicted that none of the outcomes of interest would change, but we found that they all did.
106. Non-GSA Mortgage-related ABS issuances peaked in 2003 at over $3.2 billion. That peak was followed by a drop to $2.3 billion in 2004 and slight recovery to $2.7 billion in 2005. *US Mortgage-Related Securities Issuance and Outstanding (xls)*, Securities Industry and Financial Markets Association (SIFMA) (June 3, 2014), http://www.sifma.org/research/statistics.aspx (accessed June 11, 2014). GSA backed securities also peaked in 2003 at 2.8 billion. *US Agency Mortgage Securities Issuance and Outstanding (xls)*, Securities Industry and Financial Markets Association (SIFMA) (June 3, 2014), http://www.sifma.org/research/statistics.aspx (accessed June 11, 2014).

107. One possible indication of this is the low percentage of PSLs that are ever involved in a bankruptcy. While we only have data for 2005 onwards, in 2005 less than 0.4 percent of all outstanding loans were in bankruptcy. CFPB PSL Report, *supra* note 11, at 64.
108. *US ABS Issuance and Outstanding (xls)*, Securities Industry and Financial Markets Association (SIFMA) (June 3, 2014), http://www.sifma.org/research/statistics.aspx (accessed June 11, 2014).
109. We are not aware of any significant legal changes between Q1 2006 and Q1 2007 that would affect our sample. In particular, federal loan interest rates and amount caps remained the same during this time period.
110. Ideally, we'd also like to look at the period before 2005, but unfortunately, we do not have that data.
111. *See, e.g.,* SLC Student Loan Trust 2005-3 at S-19, The Student Loan Corporation (Dec. 1, 2005), *available at* https://www.navient.com/assets/about/investors/debtasset/SLC-Loan-Trusts/2005-3/20054.pdf (6 months) (accessed June 11, 2014); SLM Student Loan Trust 2003-14 at S-43, Sallie Mae Servicing (Nov. 6, 2003), *available at* https://www.navient.com/assets/about/investors/debtasset/SLM-Loan-Trusts/01-05/2003-14/200314.pdf (3 months) (accessed June 11, 2014).
112. CFPB PSL Report, *supra* note 11, at 18. Unfortunately, we do not have data before 2004.
113. *See* Andrea Murad and Jeffrey Prackup, *Private Student Loan ABS Tutorial*, Fitch Ratings 2 ("The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 codifies this treatment by broadly defining an education loan under the bankruptcy code to include all education loans made to borrowers or to parents of borrowers attending Title IV eligible institutions. This treatment aids lenders in collecting on private loans and results in higher recoveries relative to other unsecured consumer loans."), *available at* http://www.ihep.org/assets/files/gcfp-files/Private_Student_Loan_ABS_Tutorial.pdf (accessed June 12, 2014).
114. We cannot isolate all possible causal factors and run our analyses in a vacuum, but to the extent policymakers cannot pass laws in a vacuum either, it is valuable to understand the effect of the law.
115. *See* Bob Lawless, *One More Time, with Feelings*, CreditSlips (Aug. 22, 2011), http://www.creditslips.org/creditslips/2011/08/one-more-time-with-feeling.html; Block-Lieb & Janger, *supra* note 3.
116. CFPB PSL Report, *supra* note 11, at 30. The CFPB also found that default rate for nonprofit institution loans were "approximately half of their for-profit market counterparts." *Id.*
117. 145 Cong. Rec., *supra* note 2. (statement of Rep. Graham).
118. In other words,

> [i]f an otherwise dischargeable unsecured debt is rendered nondischargeable by the law, then the bankruptcy-state scenario regarding that debt becomes worse for the debtor (it does not go away) and better for the lender (it does not go away). In a world of competitive, zero-profit lend-

ing markets, this increased payoff for the lender must be translated ex ante into an improved cost of capital for the borrower.

Furthermore, we might also expect, in "a robust private lending market . . . [to find] a bountiful capital supply available for loans." John A. E. Pottow, *The Nondischargeability of Student Loans in Personal Bankruptcy Proceedings: The Search for a Theory*, 44 Can. Bus. L. J. 245, 262 (2006).

119. CFPB PSL Report, *supra* note 11, at 17.
120. Assuming the loan would have been at 8 percent but instead was at 8.3 percent.
121. This calculation is incredibly simplified, but it was computed by multiplying the $25/year additional cost by the number of PSLs originated in Q1 2006 (15,318).
122. We consider the Block-Lieb hypothesis to be a distinct model even though it can be described as a subset of the CP model.
123. We intend to apply techniques that take the distribution of borrower characteristics into account, including quantile regression, the DiNardo, Fortin, Lemieux decomposition. John DiNardo, et al., *Labor Market Institutions and the Distribution of Wages, 1973–1992: A Semiparametric Approach*, 64 Econometrica 1001 (1996).
124. There is another avenue of further research. This chapter focuses on undergraduates at four-year institutions. Given the diversity of educational options available, such as two-year schools, certificate programs, and postgraduate education of various kinds, another extension of this work would be to consider the effects of BAPCPA on loans in these other educational markets.

Appendix 7A

Tables

Table 7A.1 Loan-Level OLS Analysis, Q1 2005 and Q1 2006

	(1)	(2)	(3)	(4)	(5)
Maximum FICO score					
Post	−5.825***	−5.890***	−5.262***		
	(0.0811)	(0.0752)	(0.679)		
N	19,759	19,759	20,170		
R^2	0.013	0.083	0.192		
Margin					
Post	0.0046***	0.0046***	0.0042***	0.0036***	0.0033***
	(4.5e-05)	(4.5e-05)	(0.00022)	(0.00022)	(0.00022)
N	19,759	19,759	20,170	20,170	20,170
R^2	0.042	0.042	0.200	0.327	0.389
Original balance					
Post	1,326***	1,325***	1,268***	1,198***	1,189***
	(16.68)	(16.88)	(104.7)	(104.1)	(103.6)
N	19,759	19,759	20,170	20,170	20,170
R^2	0.0159	0.0161	0.181	0.186	0.187
Controls					
Tuition and fees	X	X			
Year in school	X	X	X	X	X
School type	X	X			
Has a coborrower		X		X	X
Maximum FICO score				X	
Spline of maximum FICO score					X
School fixed effects			X	X	X

NOTE: *p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Each cell corresponds to a separate regression. Restricted to four-year undergraduates in the first quarters of 2005 and 2006. Spline of FICO scores in 20-point intervals.

SOURCE: Authors' calculations using CFPB private student loan data, IPEDS, and PEPS.

Table 7A.2 Loan-Level Oaxaca-Blinder Decompositions, Q1 2005 and Q1 2006

	(1)	(2)	(3)	(4)	(5)
	Panel A: Max FICO				
Before BAPCPA	720.4***	720.4***	720.3***		
	(0.654)	(0.654)	(0.706)		
After BAPCPA	715.0***	715.0***	715.0***		
	(0.388)	(0.388)	(0.402)		
Difference	5.439***	5.439***	5.377***		
	(0.761)	(0.761)	(0.812)		
Endowments	−0.329***	−0.398*	−0.939		
	(0.0941)	(0.219)	(1.200)		
Coefficients	5.967***	6.018***	1.058		
	(0.761)	(0.726)	(4.741)		
Interactions	−0.199*	−0.181	5.257		
	(0.113)	(0.117)	(4.840)		
	Panel B: Original balance				
Before BAPCPA	11,171***	11,171***	11,221	11,221	11,221***
	(42.67)	(42.67)	(0)	(0)	(42.15)
After BAPCPA	11,183***	11,183***	11,288	11,288	11,288***
	(37.65)	(37.65)	(0)	(0)	(37.05)
Difference	−12.11	−12.11	−66.82	−66.82	−66.82
	(56.90)	(56.91)	(0)	(0)	(56.12)
Endowments	−18.66*	−13.41	−399.4	−255.1	−116.2***
	(10.53)	(10.85)	(0)	(0)	(10.06)
Coefficients	−7.194	−11.60	112.4	174.2	32.94
	(56.12)	(56.07)	(0)	(0)	(56.32)
Interactions	13.75***	12.91***	220.2	14.03	16.39
	(4.836)	(4.902)	(0)	(0)	(11.01)
	Panel C: Margins				
Before BAPCPA	0.0436***	0.0436***	0.0436	0.0436	0.0436***
	(6.40e−05)	(6.40e−05)	(0)	(0)	(6.32e−05)
After BAPCPA	0.0469***	0.0469***	0.0470	0.0470	0.0470***
	(5.31e−05)	(5.31e−05)	(0)	(0)	(5.26e−05)
Difference	−0.00335***	−0.00335***	−0.00347	−0.00347	−0.00347***
	(8.31e−05)	(8.31e−05)	(0)	(0)	(8.22e−05)
Endowments	−8.05e−06	−1.41e−05	−0.000660	−0.00127	−0.00110***
	(1.12e−05)	(1.16e−05)	(0)	(0)	(4.47e−05)

Table 7A.2 (continued)

	(1)	(2)	(3)	(4)	(5)
	Panel C: Margins (continued)				
Coefficients	−0.00336***	−0.00336***	−0.00289	−0.00247	−0.00256***
	(8.24e−05)	(8.24e−05)	(0)	(0)	(7.32e−05)
Interactions	2.49e−05***	2.48e−05***	8.36e−05	0.000276	0.000194***
	(7.18e−06)	(7.28e−06)	(0)	(0)	(1.96e−05)
Controls					
Tuition and fees	x	x			
Year in school	x	x	x	x	x
School type	x	x			
Has a coborrower		x		x	x
Maximum FICO score				x	
Spline of maximum FICO score					x
School fixed effects			x	x	x

NOTE: *p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Restricted to four-year undergraduates in the first quarters of 2005 and 2006. Spline of FICO scores in 20-year intervals. Tuition and fees calculated based on IPEDS data and student's reported state of residence.

SOURCE: Authors' calculations using CFPB private student loan data, IPEDS, and PEPS.

Table 7A.3 Loan-Level Propensity Score Matching, Q1 2005 and Q1 2006

	(1)	(2)	(3)	(4)	(5)
	Panel A: Maximum FICO score				
Unmatched	−5.439	−5.439	−5.189		
	(0.777)***	(0.777)***	(0.784)***		
Average treatment on the treated	−4.971	−3.458	−4.225		
	(1.585)***	(1.402)***	(1.376)***		
	Panel B: Margin				
Unmatched	0.004	0.004	0.004	0.004	0.004
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Average treatment on the treated	0.003	0.004	0.004	0.004	0.003
	(0.001)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
	Panel C: Original balance				
Unmatched	1371.186	1371.1853	1352.15	1352.147	1352.147
	(125.50)***	(125.50)***	(127.05)***	(127.05)***	(127.05)***
Average treatment on the treated	1272.251	1120.066	1425.717	1303.748	1157.226
	(240.41)***	(213.86)***	(214.30)***	(168.91)***	(170.74)***
Number of observations					
Untreated	4,828	4,828	4,838	4,838	4,838
Treated	14,931	14,931	13,634	13,634	13,634
Controls					
Tuition and fees	x	x			
Year in school	x	x	x	x	x
School type	x	x			
Has a coborrower		x		x	x
Maximum FICO score				x	
Spline of maximum FICO score					x
School fixed effects			x	x	x

NOTE: *p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Restricted to four-year undergraduates in the first quarters of 2005 and 2006. Spline of FICO scores in 20-point intervals. Propensity scores calculated using probit regression. Nearest neighbor matching with replacement. Tuition and fees calculated based on IPEDS data and student's reported state of residence.

SOURCE: Authors' calculations using CFPB private student loan data, IPEDS, and PEPS.

Table 7A.4 Private Student Loan Volumes at the School Level, Q1 2005 and Q1 2006

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: OLS					
Post	0.546***	0.472***	0.472***	0.820***	1.008***	1.009***
	(0.169)	(0.174)	(0.174)	(0.108)	(0.0829)	(0.0811)
	1.726	*1.603*	*1.603*	*2.270*	*2.740*	*2.743*
	Panel B: Oaxaca decomposition					
Difference	0.541***	0.436**	0.590***	0.744***	0.590***	0.590***
	(0.178)	(0.182)	(0.165)	(0.222)	(0.183)	(0.180)
	1.718	*1.547*	*1.804*	*2.104*	*1.804*	*1.804*
Difference due to endowments	–0.00419	0.00179	–0.135	−0.0761	−0.292**	−0.289**
	(0.0484)	(0.0489)	(0.113)	(0.180)	(0.138)	(0.136)
	0.996	*1.002*	*0.835*	*0.927*	*0.747*	*0.749*
Difference due to coefficients	0.546***	0.492***	0.873***	0.974***	1.069***	1.072***
	(0.170)	(0.184)	(0.103)	(0.154)	(0.0777)	(0.0748)
	1.726	*1.636*	*2.394*	*2.649*	*2.912*	*2.921*
Difference due to interactions	0.000748	–0.0581	–0.148*	−0.153	−0.187**	−0.193**
	(0.00896)	(0.0857)	(0.0825)	(0.144)	(0.0757)	(0.0769)
	0.999	*0.944*	*0.862*	*0.858*	*0.829*	*0.824*
	Panel C: Propensity score matching					
Average treatment on the treated	0.993***	1.016***	1.146***	1.141***	1.148***	1.148***
	(0.0408)	(0.0412)	(0.0413)	(0.0410)	(0.0412)	(0.0413)
	2.699	*2.762*	*3.146*	*3.130*	*3.152*	*3.152*
Controls						
Tuition and fees	x	x	x	x	x	x
Graduation rate		x	x	x	x	x
Carnegie classification			x	x	x	x
ln(full-time equivalent students)				x	x	x
HBCU, HSI					x	
% black, % Hispanic						x

NOTE: *p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Marginal effects in italics. Restricted to four-year undergraduates in the first quarters of 2005 and 2006. Marginal effects calculated by exponentiating estimated coefficients. Outcome is natural log of PSL borrowers in the lender data.

SOURCE: Authors' calculations using CFPB private student loan data, IPEDS, PEPS, and Title IV Program Volume Reports.

Table 7A.5 Difference-in-Difference Estimates of the Effects of BAPCPA on Loan Volumes and Original Balances, Q1 2005 and Q1 2006

	Control group				
Outcome	(1)	(2)	(3)	(4)	(5)
	Stafford subsidized loans	Stafford unsubsidized loans	All Stafford Loans	PLUS Loans	All federal loans
Loan volumes					
ln(originations)	0.512***	0.459***	0.491***	0.450***	0.487***
	(0.0210)	(0.0215)	(0.0210)	(0.0231)	(0.0207)
	1.669	*1.582*	*1.634*	*1.568*	*1.627*
ln(borrowers)	0.491***	0.438***	0.471***	0.434***	0.467***
	(0.0208)	(0.0214)	(0.0209)	(0.0231)	(0.0206)
	1.634	*1.550*	*1.602*	*1.543*	*1.595*
Average loan size					
Original balance	641.6***	647.5***	624.5***	−120.7*	542.9***
	(163.5)	(159.9)	(161.2)	(68.55)	(143.1)
ln(original balance)	0.0544***	0.0451***	0.0450***	-0.0143*	0.0330***
	(0.0153)	(0.0151)	(0.0148)	(0.00843)	(0.0117)
	1.056	*1.570*	*1.046*	*0.986*	*1.034*

NOTE: *p < 0.10; **p < 0.05; ***p < 0.01. Standard errors in parentheses. Marginal effects in italics. Restricted to four-year undergraduates in the first quarters of 2005 and 2006. Marginal effects calculated by exponentiated estimated coefficients. Note that program effects on loan size may be biased downward.

SOURCE: Authors' calculations using CFPB private student loan data, IPEDS, PEPS, and Title IV Program Volume Reports.

Appendix 7B

Bias in Difference-in-Differences Estimates

Suppose that the outcome equation for federal loans is determined by the following equation and that y_i^* is bounded above by y^{max}

$$y_i^* = f(x_i) + \varepsilon_i$$

$$y_i = \begin{cases} \tilde{y} \; if \; y_i^* \geq \tilde{y} \\ y_i^* \; otherwise \end{cases}$$

Then the observed mean first difference, $\left(\overline{y_f^{post}} - \overline{y_f^{pre}}\right)$, can be written as a function of the uncensored loan amount, b_i^* function, and the maximum loan amount allowable.

$$\overline{y_f^{*,post}} - \overline{y_f^{*,pre}} = \left(\overline{y_f^{post}} - \overline{y_f^{pre}}\right) + \frac{1}{y^{max} - \tilde{y}} \int_{\tilde{y}}^{y^{max}} \left(y_f^{post} - y_f^{pre}\right) ds$$

So when we take difference-in-differences when the outcome for private loans is not censored (i.e., $b_i = b_i^*$), the estimate $\hat{\delta}$ of program effect δ is biased downwards.

$$\hat{\delta} = \left(\overline{y_p^{*,post}} - \overline{y_p^{*,pre}}\right) - \left(\overline{y_f^{*,post}} - \overline{y_f^{*,pre}}\right)$$

$$= \left(\overline{y_p^{post}} - \overline{y_p^{pre}}\right) - \left[\left(\overline{y_f^{post}} - \overline{y_f^{pre}}\right) + \frac{1}{y^{max} - \tilde{y}} \int_{\tilde{y}}^{y^{max}} \left(y_f^{post} - y_f^{pre}\right) ds\right]$$

$$= \delta - \frac{1}{y^{max} - \tilde{y}} \int_{\tilde{y}}^{y^{max}} \left(y_f^{post} - y_f^{pre}\right) ds$$

We do not observe $y_f^* \geq \tilde{y}$, so we cannot estimate the magnitude of the bias.

Appendix 7C

Stiglitz-Weiss Analysis

This appendix contains the relevant theorems, notation, and equations from Stiglitz and Weiss's 1981 paper. For ease of discussion, we retain Stiglitz and Weiss's numbering.

Each project, indexed by θ, is assumed to have a probability distribution of gross return R. The distribution of returns is denoted $F(R,\theta)$ and the density of returns is denoted $f(R,\theta)$. Higher values of θ correspond to higher levels of risk in the sense of mean-preserving spreads, i.e., for $\theta_1 > \theta_2$

$$\int_0^\infty Rf(R,\theta_1)dR = \int_0^\infty Rf(R,\theta_2)dR$$

then for $y \geq 0$,

$$\int_0^y Rf(R,\theta_1)dR \geq \int_0^y Rf(R,\theta_2)dR$$

An individual who borrows amount B at interest rate $\hat{r}$ repays his loan if $R > B(1 + \hat{r})$. Note that this is a simplification from the Stiglitz-Weiss model as there is no term for collateral, since student loans are unsecured. The return to the creditor or bank is denoted $\rho(R, \hat{r}) = \min (R, B(1 + \hat{r}))$. Upper bars denote means.

Theorem 1: For a given interest rate $\hat{r}$, there is a critical value $\hat{\theta}$ such that a firm borrows from the bank if and only if $\theta > \hat{\theta}$.

Theorem 3: The expected return on a loan to a bank is a decreasing function of the riskiness of the loan to the bank.

Theorem 5: Whenever $\rho(\hat{r})$ has an interior mode, there exists supply functions of funds such that competitive equilibrium entails credit rationing.

Corollary 1: As the supply of funds increases, the excess demand for funds decreases, but the interest rate charged remains unchanged, so long as there is any credit rationing.

Equation (7.5): (Zero-profit condition)

$$\Pi\left(\hat{r},\hat{\theta}\right) = \int_0^\infty \max[R - (\hat{r} + 1)B; 0]dF\left(R,\hat{\theta}\right) = 0$$

Private student loan borrowers are analogous to the firms in the model: projects, or school-major choices, with different mean returns can be distinguished from each other—to the lender returns to education for individuals in the same major at the same school are drawn from the same distribution.[1] Private student loan borrowers with the same expected mean return differ from each other in their risk parameter, which Stiglitz-Weiss denote θ, where risk is increasing in θ. In the analysis below, we consider credit score a proxy for $-\theta$, since risk is decreasing in credit score. The BAPCPA reforms that effectively made most loans nondischargeable in bankruptcy decrease the risk associated with any given loan, which effectively increases the expected return to the creditor, as described in Stiglitz and Weiss's Theorem 3.[2]

Given the Stiglitz-Weiss model and the theories described in the paper, our hypotheses for the effect of the change to the bankruptcy laws making private student loans presumptively nondischargeable can be stated as follows:

- *H1—Loan pricing (that is, lender margins) should remain the same for originations after the law change.* Since the profitability of a given loan increases for creditors, following Theorem 3 the supply of credit should increase.[3] Assuming an interior mode for the return to the creditor of lending at a given interest rate, Theorem 5 implies that credit rationing will still exist. Given these conditions, Corollary 1 states that "as the supply of funds increases, the excess demand for funds decreases, but the interest rate charged remains unchanged, so long as there is credit rationing."[4]
- *H2—Lenders should be willing to lend to borrowers with lower credit quality than they were willing to lend before the law change.* This is essentially a decrease in the critical value $\hat{\theta}$, which Theorem 1 states that an individual will borrow from the creditor if and only if the borrower's value of θ exceeds $\hat{\theta}$.[5]
- *H3—Overall loan volumes should increase.* This follows from the argument presented for H1.

Appendix Notes

1. One can think of a choice of major at a particular school as an investment with uncertain returns. For example, a freshman liberal arts student might know the distribution of returns of liberal arts majors from his school but does not know what his particular return will be ex ante.
2. *See* Stiglitz and Weiss *supra* note 64.
3. Theorems refer to theorems in Stiglitz and Weiss's paper.
4. *Id*. at 398.
5. Consider Stiglitz and Weiss's Equation (5). *Id.*